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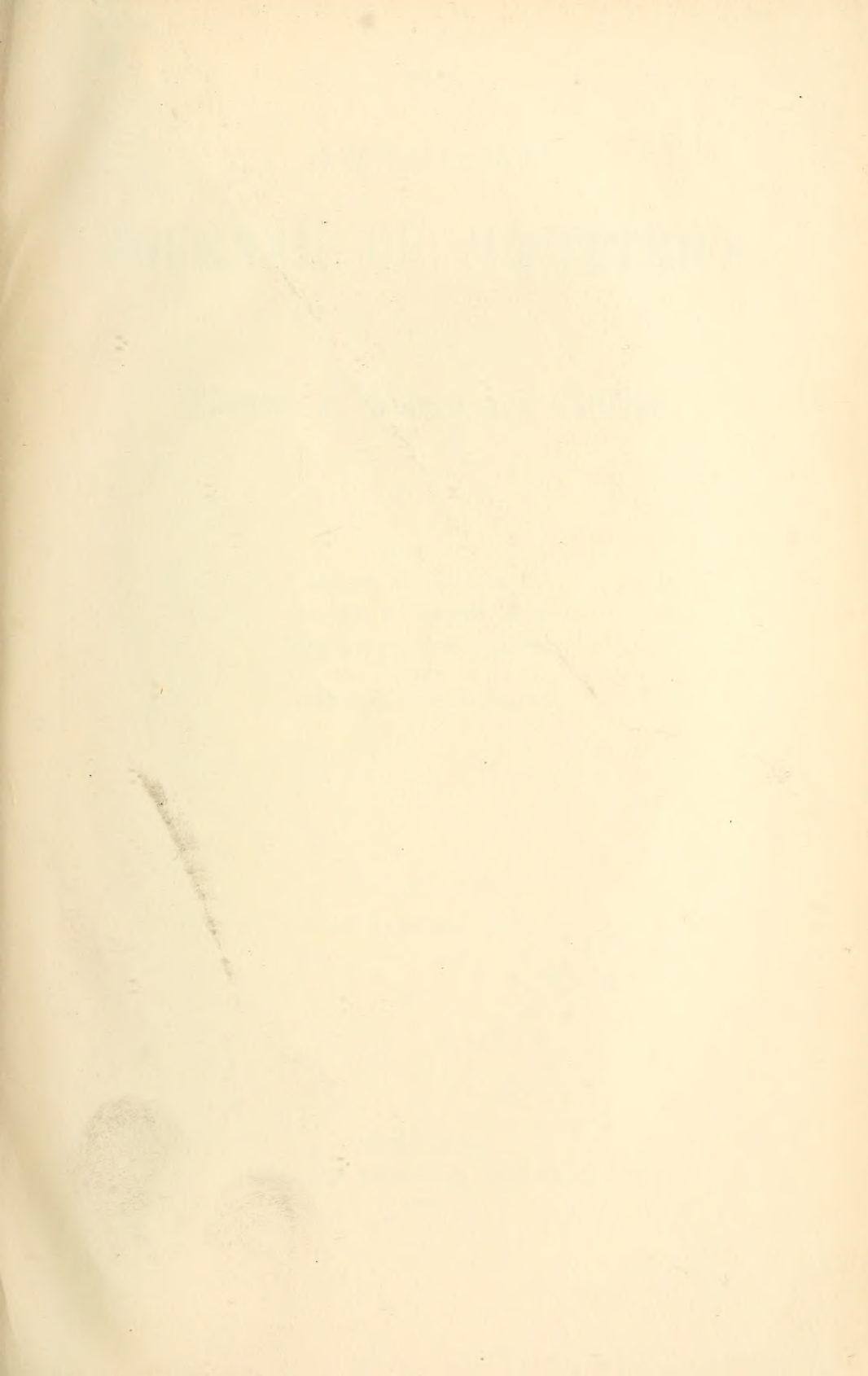
















Med.  
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THE  
AMERICAN  
JOURNAL OF OBSTETRICS

AND  
Diseases of Women and Children

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VOLUME LXVI.  
June-December, 1912

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NEW YORK  
WILLIAM WOOD & COMPANY  
1912

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THE AMERICAN  
JOURNAL OF OBSTETRICS  
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DISEASES OF WOMEN AND CHILDREN.

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VOL. LXVI.

JULY, 1912.

NO. 1

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ORIGINAL COMMUNICATIONS.

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THE USE OF FETAL SERUM TO CAUSE THE ONSET OF  
LABOR.\*

BY

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THE study of obstetrics has not in any period of time received the attention as have the other special branches of medicine and surgery. Obstetrics even to-day does not occupy the position it should. Somehow it is treated as a medical condition. With all our attempts to place labor normal and abnormal on a purely surgical basis, we failed entirely and completely. It is difficult to ascribe to one single factor the anomalous position the practice of obstetrics at present occupies.

The surgical and mechanical aspects of labor have in recent years made great strides and obstetricians at present have formulated definite principles governing the various complications that present themselves during pregnancy or labor.

However, the same cannot be said of the physiology and pathology of pregnancy. In this respect very little progress has been made in recent years. We are still in the dark as to the cause of the toxemias of pregnancy and until recently we had no conception whatsoever as to the cause of the onset of labor.

The importance of investigating and establishing the true cause of labor pains or what causes pregnancy to terminate is apparent to all. If the true etiology is established it may solve

\* Read at the Annual Meeting of the Medical Society of the State of New York April 18, 1912.

the problem both physiological and pathological that present themselves in the pregnant woman and in this way change the entire scientific aspect of obstetrics.

The reason for the onset of labor was sought long before obstetrics was practiced along scientific principles. The explanation of Hippocrates is familiar, namely, the child being forced by hunger in the last days of pregnancy braces itself with its feet against the fundus of the uterus and in this manner induces labor pains and is born by its own weight. This view was entertained during antiquity. Even up to more recent times the conception prevailed that the active fetal movements bring the onset of labor. Galen was the first to impress that the birth of the child was dependent upon the contraction of the uterus and the active dilation of the cervix, thus attaching considerable importance to abdominal pressure. Very many fanciful theories were at various times advanced; such as over distension of the uterus with the consequent stimulation of the cervical ganglia causing the onset of labor; the overcharge of placental blood with carbonic acid and a deficiency of oxygen, were for a long time thought to be the true causes of the onset of labor.

For a great number of these theories it can be said that none afforded a wholly satisfactory explanation as all of them were not based on scientific investigation.

In recent years the studies of immunity and anaphylaxis have opened new channels for investigation of the various physiological and pathological phenomena, and it was but natural that the cause for the onset of labor should be sought and studied along these lines. Sauerbruch and Heyde (*Munch. med. Wochenschr.*, 1910) were the first to make use of a natural case in this direction which is the well-known one described by Schauta (*Gynäk. Rundschau.*, 1910, Bd. xii, No. 50, p. 2617) and Basch, (*Munch. med. Wochenschr.*, 1910, No. 21, p. 987). of the united twin sisters Blazek, one of whom became pregnant. During pregnancy the other one developed a series of secondary phenomena characteristic of pregnancy, but she was not influenced by parturition itself.

Sauerbruch and Heyde tried this "natural experiment" on animals.

*Series 1.*—They sewed a pregnant rat to a normal male or female. They noticed that pregnancy was not influenced nor was the other normal partner in any way disturbed, but that a few hours before the onset of labor the other rat became very

sick and fell into a state of complete apathy which continued throughout the birth act. In a number of animals there appeared tetanic contraction or twitchings similar to those of uremia, either spontaneously or by the use of external stimulation. A number of the animals died of these manifestations; the survivors were those who had been united for a longer time to the pregnant ones. Both authors considered the symptoms as those of an intoxication brought about by substances formed during or shortly after birth and are then harmless for the pregnant partner. They explained the absence of symptoms in those partners joined for a longer time, by the development of immunity or habitude.

*Series 2.*—How far can the birth act at the end of normal pregnancy influence the beginning of pregnancy? Out of five cases, three aborted and in the other two no effect was produced. They explained the absence of abortion on the ground of lessened susceptibility of the uterus. They considered the substances which bring on contraction of the uterus as specific.

As a result of these experiments by Sauerbruch and Heyde, Professor Henkel asked Dr. A. von der Heide to try these experiments on human beings with the difference that blood of active parturients was injected.

Heide injected four patients in the last weeks of pregnancy, with 8 to 20 c.c. of defibrinated blood obtained during the stage of dilation and expulsion. No changes in pulse, temperature or other abnormal findings were noted. In one case, immediately after injection the patient became restless, dyspnea, cyanosis and sweat followed; pulse rose from 80 to 140. Recovery from collapse took place in ten minute without further distress.

Although these injections of parturients' serum gave no result, it did not seem to Heide to be without promise to try fetal serum instead; inasmuch as Lockman and Thies (*Biochem. Zeitsch.*, 1910, Band xxv, Heft 2-3, p. 120) had observed distinct changes after such injections into gravid animals. In their experiments they found that all pregnant animals reacted after the first injection of fresh fetal rabbits' serum while of the nonpregnant rabbits, 71 per cent. reacted after one or more injections, showing that pregnancy in itself may be considered anaphylactic to serum of their species.

If we suppose that analogous changes exist between mother and fetal serum, then the continual interchange between maternal and fetal circulation opens a perspective for the etiology of

puerperal changes in the mother's organism, and the diseases thereof. Very likely puerperal toxicity, especially eclampsia is the result of an overcharging of the mother's organism with unchanged fetal protein. Von de Heide tried these experiments on twenty-six pregnant women.

It is my intention to incorporate his experiments and the conclusions derived therefrom in this paper, in order to enable the reader to form his own opinion and conclusion as to the value of these investigations. The experiments of Heide and that of my own will practically form all the literature on the subject up to the writing of this paper.

#### EXPERIMENTS OF VON DER HEIDE.

*Group I. Induction of Labor. Experiment 1.*—Ros., twenty years, i-para; due beginning of February. Distinct dermatography. 9.11., intravenous injection of 17.5 c.c. fetal serum. Three hours after injecting, labor pains set in. Face reddened, slight apathy, sensorium clear. Pains in the beginning every ten to fifteen minutes; in the second hour every four to five minutes; in the third hour every three minutes; after four hours every two minutes. During the next hour pains subsided somewhat, every five minutes, varying in intensity but at regular intervals. Patient slept at first; later became restless for a short time. Three-quarters of an hour after onset of pains, vaginal examination revealed the same findings as four days previously; cervix 2 c.c. long, os one finger dilated. Three hours after injection, temperature rose from 35.8 to 39.4 C.; soon afterward pains followed. Fetal heart sounds during rise of temperature varied. Duration of labor sixteen hours. Premature child, male, 2700 gm., 47 cm. long. Fontanels wide open. Lanugo on whole body. Mother's urine negative.

*Experiment 2.*—Helm., twenty-two years, i-para; due 8.11. Distinct dermatography. 26, 11, intravenous injection of 17.5 c.c. fetal serum. Four hours after injection onset of labor pains. Breathing loud, difficult, chilly and burning feelings, cold sweat. Rise of temperature to 37.6 C; pulse between 96 and 106. Duration of labor ten and a half hours; male, full term child; 3300 gm., 52 cm. long, mother's urine negative.

*Experiment 3.*—Ber., twenty-one years, i-para; due beginning of March 27, 1911, intravenous injection of 2 c.c. fetal serum. Ten minutes later labor pains set in (previously no history of pains obtainable even after closest questioning). The first con-



tractions painless, occurring every ten to twelve minutes. After three-quarters of an hour increase of contractions. Duration of labor twenty and a half hours (generally contracted pelvis). On account of low impaction, forceps applied. Child, female, 3580 gm.; 51 cm. long. Temperature, pulse, urine of mother negative.

*Experiment 4.*—Steg., nineteen years, i-para. Due 10, 11. On 1, 11, intravenous injection of 2 c.c. fetal serum. Previous internal examination; cervix  $1\frac{1}{2}$  cm. long; os closed. Cyanosis. Temperature rose from 36.5 to 37.1 C. Onset of contractions and pains as in Case 3. Duration of labor eleven and three-quarter hours. Child 2110 gm., 47 cm. long.

*Group II. Transient Pains. Experiment 5.*—Mey., twenty years, i-para, sixth month. Transferred from psychopathic clinic for the interruption of pregnancy. 4-111 injection of 3 c.c. fetal serum intervenously. 6-111 injection of 30 c.c. fetal serum. Three hours later slight pains which soon passed. Cyanosis. Temperature and pulse negative seven and a half hours; later 30 c.c. fetal serum was again injected intravenously; no reaction whatever.

*Experiment 6.*—Baum, twenty-three years, i-para; in last month. 18, 11, 2 c.c. fetal serum intravenously, no effect. Temperature rose from 36.8 to 37 C. Three and a quarter hours after injection, irregular pains set in which gradually subsided. Essential change in vagina and os not demonstrable. (For other reasons it became necessary to induce labor.)

*Experiment 7.*—Bau., twenty years, i-para. Due beginning of April. On 13, 11 first injection intravenously, 18 c.c. fetal serum. Two hours later irregular pains between long intervals; four hours later pains increased. Temperature rose from 36.5 to 38.1 C., pulse to 132, pains and temperature subsided. Spontaneous birth on 21, 111; female child, 48 cm., 2350 gm.

*Group III. Use in Inertia. Experiment 8.*—Zim., twenty-one years; i-para. After four hours of labor complete inertia set in, lasting thirty-one hours. Os barely two fingers dilated, cervix almost obliterated, bag of waters intact, head well engaged.

Injection of 8 c.c. fetal serum. In twenty minutes onset of strong pains which led to the expulsion of a strong child nine hours after injection.

*Experiment 9.*—K., twenty years, i-para. Weak pains every seven minutes; after intravenous injection of 10 c.c. fetal serum, pains markedly increased in force and frequency. In one and a half hours temperature rose to 38.6 C; four hours later, second injection of 20 c.c. fetal serum without affecting pains. Tem-

perature falls in one-half hour from 38 to 37.3 C. Pulse drops from 112 to 92. Forceps applied because of low transverse position.

*Experiment 10.*—Kow., thirty years, i-para. Time of onset of pains cannot be determined. At the time of the injection of 10 c.c. fetal serum head movable above brim; bag intact. Pains weak and not frequent. After injection, pains every three to four minutes, then every two minutes. Six and a half hours later she was delivered. A second injection of 20 c.c. fetal serum two and one-half hours a. p. had no appreciable effect. Pulse, temperature, urine of mother negative.

*Experiment 11.*—Arn., i-para. Tedious labor, membranes were ruptured but pains were still weak. Injection of 5 c.c. fetal serum intravenously. After two minutes, pains came at intervals of two minutes. Two hours after injection spontaneous delivery of a very strong child.

*Experiment 12.*—Hei., thirty years, i-para. Dilation continued for days without the detection of real pains. Injection of 4 c.c. fetal serum; pains began after two and one-half hours and lasted four hours; following day pains set in again and led to expulsion.

*Experiment 13.*—Ba., viii-para. Very weak pains. Injection 16.5 c.c. fetal serum. In one hour one pain; in one-half hour stronger pains which soon became rhythmic and without ceasing led to birth.

#### *Group IV. Negative Results.*

*Experiment 14,* B. 25 1; 5 fs. 31 1; 10 fs. 4 11; 20 fs.; full-term child.

*Experiment 15,* H. 17 1; 5 fs. 24 1; 10 fs. Birth 13 11 male 49 cm., 2350 gm.

*Experiment 16,* M. 11 2; 20 fs. 15 2; 30 fs. Discharged a. p.

*Experiment 17,* G. 10 3; 3 fs. 12 3; 30 fs., three hours after second injection 20 c.c. Birth 1.5; fem. 52 cm., 3300 gm.

*Experiment 18,* P. 5 4; 2 fs. 7 4; 20 fs. Birth 23 4; fem. 47 cm., 2400 gm.

*Experiment 19,* H. 8 4; 2 fs. 18 4; 48 fs. Birth 27, 4, full term.

*Experiment 20,* S. 6 3; 3 fs. 7 3; 30 fs. Birth 25, 3, full term.

*Experiment 21,* F. 8 4; 2 fs. 12 4; 20 fs. Birth 16 4; 54 cm., 3250 gm.

*Group V. Experiment 22.*—Thom., thirty-three years, iii-para, eleven days a. p. Two injections 2 c.c.—30 c.c. without reaction. During second stage injection of 5 c.c. fs., twenty minutes a. p. Three hours p. p. injection of 25 c.c. fs., in one and one-half hours rise of temperature from 36.5 to 37.8. Pulse unchanged.

Four hours after second injection another injection of 20 c.c. ovarian extract; temperature in one and one-half hours. Patient complains of headache, is restless. Temperature slowly subsides.

Urine before injection negative. Amount for 24–30 hours p. p., 1000 c.c. bloody (catheterized specimen). Micros. r. b. c. numerous. Forty-eight hours postpartum 1500 c.c. red blood cells disappeared.

*Group VI. Experiment 23.*—Kon., twenty-four years, i-para. In tenth month of pregnancy. First injected for two weeks (14–iii to 1–iv) with increasing doses of 2–11 c.c. fetal serum intramuscularly. The separate injections were without results. On 4–iv pains (contractions), not felt by this otherwise sensitive woman, set in. Duration of labor sixteen hours; strong child, 51 cm., 3500 gm.

*Experiment 24.*—Heil., twenty years, i-para. In tenth month. During same time as above. Injected intramuscularly with six increasing doses of 1 c.c. fetal serum. Birth at term 5–iv. Duration of labor fourteen hours. Strong child 54 cm., 4000 gm.

*Experiment 25.*—Bau., thirty-two years, i-para. Received intramuscularly increasing doses of 1–12 c.c. fs. from 13–iii to 8–iv. After fourth injection (6 c.c.), flow of blood, weak pains. Temperature rises from 37 to 38.7, pulse from 104 to 120 in one hour; five hours after highest temperature; intravenous injection of 5 c.c. given. Slow falling of temperature.

Two days later increasing doses of fetal serum were again injected. The last time, 8–iv, 12 c.c. fs. Soon after, pains every four to five minutes, which subsided three hours after the injection. Birth on 9–iv. Female 53 cm. long, 3360 gm.

*Experiment 26.*—Tr., twenty-three years, i-para. Fifth to sixth month. Marked vomiting of pregnancy which is increased by a few intramuscular injections of fetal serum. Spontaneous premature birth in seventh month; child lives.

#### RESULTS OF EXPERIMENTS.

In four cases after injection of serum labor pains set in which led to expulsion. In three cases one injection sufficed. In two

cases a slightly larger second injection was given after the first injection. The subjects of these experiments were women in the last weeks of pregnancy, or shortly before a. p. Careful questioning revealed that the women had no labor pains previous to injection. Cases 3 and 4 were very nearly at term; this may explain why the small amount of 2 c.c. fetal serum sufficed to cause labor to set in.

Case I illustrates particularly well our explanation that the pains produced by the injection signify the actual beginning of labor; even three-fourth hour after the commencement of pains the same vaginal findings were present as four days previous.

In the first two cases there was a rise of temperature soon after the injection. In Case I it rose to 39 C. which subsided during labor and left no visible effects upon mother or child. The pulse showed little change.

In the three following cases (Group II) the pains appeared transiently. In Cases 5 in which abortion was indicated because of epilepsy, pains were observed for three hours after injection; they were only slightly felt and subsided after three hours. Their action was demonstrable by the shortening of the cervix. We injected in this case 3 c.c. fetal serum and followed this in three days with 30 c.c. In the second case the temperature rose after the second injection to 37 C., the pulse was at a maximum after five hours (132, previously 104). One-quarter hour after maximum temperature, irregular labor pains set in which continued for six hours. This effective second dose having ten times the strength of the first was given three days after the first injection.

Differing from this we have Case 111, in which pains set in after first injection of 18 c.c. and one and a half hours before maximum temperature of 38 C. (36.5 previous to injection). The pulse rose from 96 to 132. The second injection of 25 c.c. given four days later, gave no reaction as far as pains, temperature or pulse were concerned, but we must note here that the birth of a child 48 cm., 2350 grams, occurred four days after the injection. A causative relation between injection and labor cannot in this case be positively proven because of the four days interval; the only noteworthy feature is that the child was not at full term. Since in the other two cases it was necessary to induce premature labor this factor cannot be considered further.

The third group of experiments confirmed our theoretical supposition that because of the previous positive results in the first



group, fetal serum could be favorably used in the treatment of primary and secondary inertia. In Case 8 pains had ceased completely after four hours duration. In the five other cases the pains were weak in intensity and not frequent. In Case 12, thirty years, i-para, dilation of the cervix lasted a few days, without the sensation of labor pains. After injecting 4 c.c. fetal serum pains set in in two and a half hours which gradually increased in intensity and lasted four hours; on the next day after a period of inertia they set in again and led to the birth of a full term baby.

In Case 11 secondary inertia (narrow pelvis) the pains ceased almost completely after the rupture of membranes. In all three cases strong contractions set in in from four to fifteen minutes after the injection at intervals of three to four minutes. The quantitative and qualitative change in the pains after the injections was self-evident.

Group 4 contains those cases which showed no effect after the second or third injection of fetal serum. Case 18 deserves mention because sixteen days after the second injection (ten gradually increasing doses were given two days afterward) a child 47 cm., 2400 grams, was born, evidently fourteen days before term. In this case also the relation between injection and birth is not improbable, especially when we consider all the evidences of prematurity in the new-born. The reasons for the failure of the injection we will consider later.

In the fall of the past year an editorial appeared in the *Journal of the American Medical Association*, commenting on the investigations of Heide and what these experiments may lead to if they prove to be positive.

We immediately familiarized ourselves with the original work of Heide and began to make preparations for experiments along the same lines at the Jewish Maternity Hospital, following closely the methods and dosage of Heide with some slight modifications to suit the individual case. The serum was prepared as suggested in Heide's original paper. The house surgeon was instructed to admit cases to the hospital which were not in labor, particularly patients in the last weeks of pregnancy who came for some general information pertaining to their pregnant state.

Realizing the gravity of such experiments in a public hospital in this city, we were very cautious in the beginning. We were fully aware that any untoward accident would interrupt all our

work and in addition we would have to face serious consequences. Fortunately, nothing of importance occurred to mar our investigation until the latter stage of the work. At that time we were quite familiar with the general routine and technic.

Dr. George Krupp was associated with me in this work and was in charge of all the clinical data of the patients after they had been injected. The intravenous method was used in all our experiments. At the earlier stage of our work a vein in the arm was exposed by a small skin incision, but later we found it unnecessary and the vein was entered directly with a needle through the skin. A rubber bandage or a piece of rubber tubing was placed on the arm above the point of entrance, in order to engorge the veins, and then, the most prominent vein was selected for injection. As a rule we succeeded in entering the veins at the first attempt.

I shall enumerate the experiments as they occurred in the hospital. We could not group our cases because the hospital service does not permit a waiting list, but I shall attempt to classify them in the summary of these experiments.

*Experiment 1.*—R. E., thirty-three, iii-para, at term. Admitted November 20, 1911, no dilation, membranes intact, cervix thick, head not engaged, no pain. November 21, 1911, 12.35 P. M.: 5.5 c.c. of fetal blood serum injected intravenously. Pulse, temperature, and respiration before injection normal. Fifteen minutes after injection temperature 99, pulse 120, respiration 32. Uterine contraction noticed. At 6 P. M. patient began to complain of slight pain. At 10 P. M. the pains occurred every five to six minutes. At 12 A. M. every three minutes. At 1 A. M. patient felt nauseated and vomited. The pains continued during the night and at 7 A. M. she was fully dilated. Delivered at 10 A. M. November 22; child weighed 9 pounds 3 ounces.

*Experiment 2.*—C. G., twenty-four, ii-para. Admitted November 22, 1911. Last menstruation eight months ago, due toward the middle of December. Head not engaged, cervix not dilated. Temperature, pulse and respiration normal. Injected at 4.30 P. M. 7 c.c. of fetal blood serum. One hour later temperature 99.2, pulse 88, respiration 24. Began to have pains at 6 P. M. At 7 P. M. pains came on every four minutes. At 9 P. M. patient had a severe chill lasting four to five minutes. The pains continued and at 2.15 A. M. patient was delivered spontaneously of a child weighing 4 pounds, 11 ounces and premature.

*Experiment 3.*—E. O., twenty-two, i-para. Admitted Nov. 26, 1911, due December 15. No pain, no dilation of the cervix, membranes intact, head presenting. November 27 injected 8 c.c. fetal serum. No reaction. November 28, 12 P. M. injected 20 c.c.; slight pains in the abdomen during the afternoon. Patient left the hospital November 29. Readmitted December 21. Patient had a slight bloody discharge but no pain. December 2 at 10.30 P. M. injection of 19 c.c. fetal serum. Temperature 98.4, pulse 94, and respiration 20. Blood pressure 128 to 130. Patient began to have pains toward the morning of December 3. At 10 A. M. she felt nauseated and vomited a great deal. Delivered December 3, 12 A. M. premature child weighing 5 pounds.

*Experiment 4.*—R. B., twenty-three years, iii-para. Admitted November 26. Slight pain in the back cervix, two fingers dilated, membranes intact, head engaged, L. O. A. Pains subsided shortly after admission. Injection of 10 c.c. fetal serum at 2.25 P. M., November 27. Patient began to have pains toward the evening which became stronger during the night and she was delivered at 8.35 A. M., November 28, child weighing 7 pounds 12 ounces.

*Experiment 5.*—I. G. thirty-two years, iii-para. Admitted November 30. Two fingers dilated, membranes ruptured, head not engaged. At term, no pains. November 30, 10.15 P. M. injection of 5 c.c. fetal serum. At 1.30 A. M. slight pains in the back lasting 20 to 25 seconds. December 1, 11.30 A. M. no pain, was injected with 19 c.c. Pulse immediately rose from 100 to 142 and patient felt nauseated, began to have pain in the back which subsided later. Patient delivered December 5, 12.15 A. M. child weighing 6 pounds, 15 ounces.

*Experiment 6.*—F. S., thirty years, i-para. Flat pelvis; first child living, the other two pregnancies resulted in still-born children on account of difficult deliveries. Was due January 12. Admitted to the hospital for induction of labor on account of flat pelvis. December 22 at 4 P. M., injection of 5 c.c. fetal serum. Temperature 97.8, pulse 80, respiration 24, blood-pressure 145; slight reaction. At 8.50 P. M. injection 20 c.c. fetal serum, commenced to have pain at 9.05 or fifteen minutes after injection. At 9.15 patient had a severe chill, pain in the head, pulse became thready; she developed cardiac oppression and precordial pain, labored respiration; chill lasted 18 minutes. At 9.30 P. M., temperature 102.8, pulse 130, and respiration 32. At 10.25 she vomited. 10.35 P. M., temperature rose to 104.4, pulse 140,

respiration 40. The pains came on more frequent and at 10 A. M. December 3, the cervix was two-thirds dilated. At this stage the membranes ruptured. Patient also developed a severe herpes labialis. She began to improve toward the morning and at 1 P. M. after full dilation of the cervix delivery was accomplished by breech extraction. The child was still-born. Fetal heart sounds were present before patient became ill, but could not be elicited after she recovered from shock one hour before delivery.

*Experiment 7.*—J. W., twenty-three years, ii-para. Admitted December 2, at term, slight pain in the back, cervix thick, not dilated, membranes intact. Patient kept under observation during the next twenty-four hours, but she had no pain. Injection at 9 P. M., of 9 c.c. of fetal serum and no effect whatsoever noted. Patient left the hospital December 5; readmitted December 8, cervix two fingers dilated and in active labor. She was delivered at 12.20 P. M. full term child, weighing 6 pounds.

*Experiment 8.*—R. B., v-para. Admitted to the hospital in the fifth month of pregnancy, suffering from chronic endocarditis with signs of failure of compensation. December 16, injection 5 c.c. fetal serum, no reaction and no pain. December 17, at 3 P. M. injection with 18 c.c. fetal serum. Two hours later patient felt nauseated and vomited a great deal, was very restless. She left the hospital December 18.

*Experiment 9.*—E. F., twenty-six years, iii-para. Admitted November 27, 9 P. M., cervix one finger dilated, membranes intact, head not engaged; due December 15. November 29, 4.40 P. M. injection of 28 c.c. fetal serum without effect. Refused to be injected again and left the hospital the same day. She was readmitted December 18, and was delivered at 9 A. M. Child weighing 8 pounds 6 ounces.

*Experiment 10.*—S. G., thirty-three years, iii-para. Admitted December 4, cervix three fingers dilated, membranes intact, head engaged; at term. Pains subsided shortly after admission. At 12.30 P. M. injection 5.5 c.c. of fetal serum. Commenced to have pains during the afternoon and toward the evening patient was in active labor. Delivered December 5, at 3 A. M.

*Experiment 11.*—R. G., i-para. Admitted November 30, head engaged, membranes intact, cervical canal closed, no pain. Due December 7. 11.30 A. M. 32 c.c. fetal serum were injected; no effects were noticed. She left the hospital the following day and was readmitted December 11 and delivered at 3.25 A. M., child weighing 5 pounds 14 ounces.



*Experiment 12.*—A. R., twenty-two years, i-para in the eighth month of pregnancy. Admitted to the hospital December 7 for the induction of labor on account of endocarditis which commenced to give signs of failure of compensation. Temperature, pulse and respiration normal, blood-pressure 118. December 7, injection of 8 c.c. fetal serum no reaction. Injected again at 7.15 P. M., no effect. Patient refused further treatment and left the hospital.

*Experiment 13.*—I. U., twenty-three years, i-para. Admitted December 24, 10.30 P. M., membranes intact, head not engaged, at term, slight pain in the back. December 26, 10.55 A. M., injection of 6 c.c. fetal serum. Ten minutes later contraction of the uterus was noticed and patient commenced to have pains. At 12 M. pains ceased. At 1 A. M. December 27, pain began anew occurring every five to eight minutes. Patient vomited a great deal during the day. December 28, pains subsided again. She was injected with 15 c.c. at 10 P. M. and began to have strong labor pains two hours later and was delivered at 6.40 A. M. December 29.

*Experiment 14.*—E. C., thirty-one years, v-para. Admitted December 25. Cervix thick, membranes intact, head presenting, no pain. Injected at 9.05 P. M., 5 c.c. fetal serum; no reaction. At 1 A. M. December 26, 20 c.c. of fetal serum were injected. Just after injection patient felt much distressed, cried out with much precordial pain; also severe pain in the back. Uterus became firmly contracted and she had a severe chill lasting thirty minutes. Temperature rose to 103, pulse 120, respiration 32. At 2 A. M., one hour after the second injection, no fetal heart sounds could be heard. Fetal heart sounds were present before second injection. Delivered spontaneously December 26, 5.15 A. M., child still-born. Patient had a severe postpartum hemorrhage which required packing of the uterus in order to control it. She also developed a severe form of herpes labialis. At the end of thirty-six hours the patient's condition became normal and she was discharged from the hospital at the end of fourteen days.

*Experiment 15.*—Patient admitted to the obstetric service of Lebanon Hospital in the ninth month of pregnancy, suffering from chronic endocarditis and failure of compensation. General treatment for the cardiac condition was instituted and she gradually began to improve. Patient was due December 29. On December 18, her general condition was fairly good and interruption of pregnancy was decided upon. December 18, at 4 P. M.

injection of 3.5 c.c. of fetal serum. She began to have pain toward evening which ceased during the night. The following morning the pains reappeared but were very weak. Another injection was deemed inadvisable because of her cardiac condition. Toward the evening the pains became stronger and lasted during the entire night. She was delivered December 20, 11 A. M., child weighing 5 1/2 pounds.

*Experiment 16.*—E. B., twenty years old, i-para. Menstruated last April 7, 1911. Married April 15, 1911. Due according to date of last menses, January 15; according to date of marriage, January 22. She suffered from congenital hip dislocation and was kept under observation for induction of premature labor because of pelvic deformity. The pelvic measurements were: interspinous 21 cm., intercrystal 22.5 cm., external conjugate 18 cm., right oblique 20 cm., left oblique 19 cm., diagonal conjugate 10 cm. She was told to come in the thirty-seventh week of pregnancy for induction of labor. She was admitted to the hospital December 28, 12 A. M. On examination the head was found above the brim, cervix not obliterated. December 28, 10 P. M. injection of 9 c.c. fetal serum. At 11 P. M. patient began to have pains in the abdomen. At 2 A. M. the pains increased. Temperature, pulse, and respiration normal. December 29, patient had irregular pains during the entire day. December 30, pains subsided. December 31, injection of 15 c.c. of pituitrin subcutaneously, but no effect whatsoever was noticed. January 1, 4.50 P. M. injection of 10 c.c. fetal serum. At 9 P. M. patient began to complain of pain in the abdomen which lasted during the entire night. January 2, injection of 15 c.c. intramuscularly. The pains increased for a short time but later subsided. January 3, cervix was two fingers dilated, head engaged, membranes bulging, but patient had no pain. January 4, pains reappeared becoming stronger during the afternoon and she delivered at midnight January 4.

*Experiment 17.*—B. S., thirty-five years, i-para. Last menses July 1, 1911. Admitted to the hospital March 15, 1912. On examination the head was found above the brim, cervix closed, membranes intact. Temperature, pulse, and respiration normal. March 16, 1 P. M. injection of 9 c.c. of fetal serum. This was followed by a chill lasting three to four minutes. No reaction in temperature, pulse, and respiration. Ten minutes later a few uterine contractions were noticed. March 17, patient complained of slight pain in the back also in the abdomen. At

12.40 P. M. she was injected again, 20 c.c. of serum, no reaction followed. At 3.30 P. M. she was again injected with 15 c.c. This was followed by a severe chill, but no pain. She was discharged March 18.

*Experiment 18.*—A. S., i-para. Menstruated July 1, 1911. Married July 11, 1911. Admitted March 22, 8.45 P. M. Vaginal examination showed no dilation of cervix, head floating above the brim, membranes intact and having no signs or symptoms of labor. Came to the hospital to inquire about pain in the back she had for the past three months. She was put to bed and slept undisturbed during the night. March 23, 1 P. M. injection of 10 c.c. of serum given. Ten minutes later patient had a chill lasting two minutes. One-half hour later she had a series of rapidly following pains. Two hours later the patient had pain in the back at regular intervals. The uterus contracted regularly, but these contractions were painless. The pain subsided and also the uterine contraction early in the morning. March 24, 2 P. M. injection of 13 c.c. of serum. This was followed by uterine contractions and no pain. Examination showed the cervix to be two fingers dilated. During the latter part of the afternoon she had irregular light pains. March 25, patient had no pain. At 1.20 P. M. examination showed the cervix to be three fingers dilated somewhat thinned out. At 1.45 A. M. she was again injected with 15 c.c. This was followed by uterine contractions and regular pains which became more severe and frequent. At 8 P. M. the cervix was fully dilated, membrane still intact. 8.30 P. M. the membranes were artificially ruptured. In the evening the pains became stronger and at more frequent intervals. She was delivered at 1.15 A. M. March 26, of a male child weighing 6 pounds, 1 ounce, apparently slightly premature.

*Experiment 19.*—D. M., thirty years, ii-para. Menstruated last, June 15, 1911. Admitted to the hospital March 4, 1912, complaining of severe frontal headache, dimness of vision and slight edema of the legs. Vaginal examination revealed the cervical canal closed and not obliterated, the head presenting. Urine was full of albumin and hyaline and granular casts. In view of the above symptoms interruption of pregnancy was decided upon. March 15, at 2 P. M. patient was injected with 11 c.c. of fetal serum. Ten minutes later she developed a severe chill lasting seven minutes. This was followed by two strong pains beginning in the back and radiating to the front. During the night patient had

uterine contractions but no pain. March 6, patient was again injected with 22 c.c. of serum. This injection was followed by a few pains of a half a minute duration. On examination the cervix was found to be three fingers dilated. March 7, 12 A. M. another injection of 22 c.c. of serum was given. This was followed by strong pains at regular intervals and she was delivered at 3.45 P. M., of a female child weighing 8 pounds. After the first injection the urine contained less albumin and fewer casts, and on the following day no albumin and no casts were found. Patient also developed a polyurea having passed 80 ounces in the twenty-four hours after the first injection of the serum.

#### RESULTS OF EXPERIMENTS.

In summing up the results of our experiments there is one difficulty to overcome, that is the lack of positive knowledge of the signs and symptoms which would point twenty-four or thirty-six hours prior to the actual onset of labor, so that one could safely state whether a given patient will go into labor within the next forty-eight hours. If this were possible to foretell then our experiments would assume the exactness most desirable in all scientific investigations. Furthermore there is another aspect in these investigations, namely that it is impossible to incorporate in a report all the observations noticed at the bedside of the patient and the result is that no matter how minutely every detail is recorded, it appears incomplete.

In many of our experiments the pulse, temperature and respiration and any unusual sign or symptom observed about the patient objectively and subjectively were recorded every fifteen minutes; but this was soon changed to hourly records. The uterus was watched for contractions at regular intervals. A nurse and member of the house staff were in constant attendance upon the patient after each injection. We were very fortunate in our series of cases as we had a number of women who, without a doubt, were not in labor or at term. Even one most inexperienced in obstetrics would pronounce them as such. A number of our patients were admitted for the induction of labor. In six patients, experiments 2, 6, 14, 15, 16, 18, one or more injections induced labor pains which led to the expulsion of the child. These patients were at least from ten to eighteen days before term. Cases 6 and 16 were admitted to the hospital for the purpose of inducing labor because of flat pelvis. They were



at least two weeks before term. In Case 15 labor was induced because of a chronic endocarditis and she was at least nine days before term. Case 14 was a private patient who called at the office to inquire regarding her shortness of breath. Had no signs of labor. She was sent to the hospital to have labor induced with fetal serum. She went into labor immediately after the second injection; in addition she suffered from a severe reaction.

Case 2 was very typical. She was distinctly three weeks before term. She had no signs of labor. Was admitted to the hospital and after the first injection of a comparatively small dose of serum, she immediately went into labor and gave birth to a premature child weighing 4 pounds.

Case 18 although not as typical as the others was undoubtedly not in labor. In order to eliminate the slightest suspicion as to whether labor would set in, she was let alone during the night and morning after her admission. She slept the entire night undisturbed, and had no pain the entire forenoon. After the first injection in the early part of the same afternoon she immediately commenced to have uterine contraction followed by pains.

Cases 6 and 14 must be studied from another aspect. As we reached this stage in our experiments we changed the method of procedure. We noticed that when the dose is large it was not effectual, so we commenced with small doses anywhere between 5 and 7 c.c. to be followed by a larger dose of 20 to 25 c.c. four or five hours later. Both patients received small doses for the first injection and large doses for the second and both suffered from severe reactions, high temperature, rise in pulse, severe chills, restlessness, and severe prostration and cyanosis. In Case 14 no radial pulse could be felt for eight hours. (This patient was a heavy cigarette smoker for the past sixteen years). In both patients fetal heart sounds were present before second injection, but no fetal heart sounds could be elicited when the temperature reached its maximum. They recovered very quickly after the child was born.

*Experiments 1 and 2.*—Two of our cases were admitted to the hospital at term but there were no signs of labor. As a rule patients are not admitted to the hospital unless they show signs of labor. Both were injected after they were observed for a few hours to ascertain if they had pain; in both, uterine contractions not painful were observed after the first injection. We have learned during our investigations that uterine contractions, however, strong they may be, do not cause pain. The patient begins

to suffer pain when the presenting part or the water bag commences to press on the cervix or the neighboring structures in the pelvis. We observed strong uterine contractions taking place, and the patient was not aware of it. We really feel justified in concluding from our observations that uterine contractions by themselves are not painful, for we had ample opportunity to watch both the initial contraction and the initial pain. On close questioning of the patient during many uterine contractions, whether she suffered from any discomfort, the answer was usually in the negative.

In inertia we found the serum to be effectual. As illustrated in Experiments 4 and 10 both patients were in labor. In Case 4 the cervix was two fingers dilated, in Case 10 three fingers dilated, membranes intact in both. The pains subsided in either case after admission; both commenced to have strong labor pains after they were injected. Small doses of the serum were used in these patients. These cases by themselves would not be convincing of the efficacy of the serum, because it could be rightfully supposed that they would probably go into active labor were they not injected, but in conjunction with other cases we think it of value as both patients began to have active labor pains within a short time after the injection. Experiment 3 we classify as doubtful. The only question which arose is whether the repeated injection did not precipitate labor. She was due December 15. November 27, 8 c.c. was injected; no reaction. November 28, 20 c.c. was injected; she had a few slight transient pains following it. She left the hospital November 29. Re-admitted December 1; was injected again December 2, 19 c.c., but no reaction. She finally gave birth December 3. It may be possible that the addition of the extra serum helped to saturate the maternal organism with that particular substance which causes the onset of labor, and in this way brought about labor at an earlier date.

Experiment 19 must be classed by itself. She was referred to the hospital with symptoms of threatened eclampsia. She had severe headaches, disturbance of vision, slight edema of the lower extremities with a history of having passed very little urine in the past twenty-four hours. Examination of urine showed it to be full of albumin and casts. Induction of labor was decided upon in view of the clinical findings. Patient was a relative of one of the nurses on the staff of the hospital. The various methods of induction of labor, including the use of fetal serum, were sug-

gested. She was asked if she had any objection to the use of the serum. Her answer was "to use my own discretion in the case." We decided to bring on labor by the use of serum, and not only did it cause the onset of labor, but all the urinary symptoms cleared up after the first injection. She passed 80 ounces in the next twenty-four hours and her general condition also improved.

#### NEGATIVE RESULTS.

Seven of the experiments proved negative. No reaction, as a rule, took place. We found that the most frequent symptoms after the first injection were chills lasting from two to thirty minutes, nausea and vomiting. Precordial pain or oppression was present in four cases. In nearly all of these cases very little reaction took place. Experiments 5 and 17 have had uterine contractions and pains, but were transient in character and subsided quickly. We are therefore not justified to assume that the pains were due to the injection of serum. The other five cases had no reaction whatsoever except for a slight nausea.

Now that we have demonstrated that fetal serum will cause the onset of labor, further investigations must be made to ascertain the actual origin of these substances. It will not be of any scientific value unless these "labor substances" are isolated from the maternal circulation or from the fetus or placenta. At present these questions will have to be held in abeyance as investigations along these lines are not sufficiently conclusive to formulate a definite theory.

In order to firmly establish that these labor substances are present either in the maternal or fetal circulations and that they act specifically on the muscular structure of the uterus causing it to contract, experiments with other protein substances will have to be conducted to ascertain whether they may not act in the same manner when introduced in the circulation of the pregnant woman.

That fetal serum does not act the same way in every case can be explained by the lessened susceptibility of the uterus as proven by Sauerbruch and Heide in their experiments on rabbits.

Schultz (*Journal Pharm. and Exp. Therapeutics*, Baltimore, 1910-11, 221-229) has conclusively shown that smooth muscle contracts quite readily when exposed to small quantities of serum. This normal irritability may be greatly augmented by first sensitizing the animal as has been done in the studies of anaphylaxis.

The contraction curve is much greater in extent than in unsensitized muscle. It also seems possible that this hypernormal irritability may be reduced to normal or subnormal if the animal was first rendered immune to relatively large doses of serum.

In our experiments we had the most severe reaction in those cases that we injected with small doses first, and followed by large doses four or five hours later. We are really at a loss to explain it. The first dose could not possibly establish a hypersensitiveness in so short a period of time, neither could it produce an anaphylactic reaction, for it requires at least eight to ten days to produce anaphylaxis. However, V. C. Vaughn and others have shown that protein fever may be produced in rabbits after the first intravenous injection of washed human blood cells. Our cases may belong to this category.

With our present hazy conception of anaphylaxis, we are unable to explain definitely the many mooted questions that arise in the course of experimenting. In all probability the whole act of labor and the toxemias of pregnancy will in the future be viewed as a mere anaphylactic reaction. The experiments of Lockman and Theis show that serious changes which must be considered as anaphylactic manifestations are produced by injecting fresh fetal rabbits' serum into full grown rabbits.

Von der Heide considers his results in reference to the onset of labor as an anaphylactic reaction. He thinks that normally the birth act is brought about by the slow transmission of fetal substances into the blood of the mother, which give rise to the formation of antibodies "labor substances" as he terms them. Toward the end of gestation these substances are transmitted to the blood of the mother in excessive amounts. That there is a deluge of these substances is proven by the contractions which arise in the last weeks of pregnancy and also by the uniform results obtained by injection of fetal serum in inertia.

The whole range of the toxemias of pregnancy and especially eclampsia should be viewed from the standpoint of an overcharged maternal circulation with foreign protein substances. In eclampsia we have many clinical manifestations pointing to this. The sudden onset of symptoms and their sudden disappearance, the sudden changes found in the urine and their sudden disappearance, the more frequent occurrence of the various toxemias in primiparas and the fact that eclampsia is more frequent in twin pregnancies tend to prove that these manifestations have their origin in the fetus or placenta.



Wolff-Eisner has proven positively that during pregnancy foreign protein substances (from the syncytium) are continually thrown into the circulation of the mother and these substances under certain conditions bring about a state of eclampsia. They contend that eclampsia must be considered as the rarest and most severe form of those symptoms dependent upon the absorption of foreign albuminoids. The single clinical manifestation of the absorption of foreign substances during pregnancy stands in the same relation clinically as the varied reactions due to the absorption of the pollen proteid, harmless conjunctivitis on the one hand and severe asthmatic attacks on the other, both caused by the absorption of the same pollen proteid.

Of great interest is Experiment 19 of our series. This patient was admitted to the hospital with symptoms of threatened eclampsia. She had albumin and casts in the urine. After the first injection of serum she began to improve, the albumin and casts diminished in amount. She developed a polyurea and in three days all the symptoms pointing to eclampsia disappeared. We can explain this phenomena by the theory advanced by R. Freund and L. Pincussohn that cases of puerperal toxemia may be cured by the injection of serum obtained from a healthy pregnant woman as it will supply the necessary antibodies which the patient does not possess.

Finally, if it is proven conclusively that these labor substances are formed in the pregnant woman only, the entire aspect of the physiology of obstetrics will be changed. The importance of these investigations is not that it may lead to the discovery of a new therapeutic remedy to induce labor, but it will establish the pregnant state and its many abnormal manifestations on a sound scientific basis.

Further investigations along these lines must be conducted. The results of von der Heide and that of my own sufficiently warrant it. We believe that in the near future our entire conception of labor and its various clinical aspects will be changed, particularly so when further progress will be made in the study of anaphylaxis.

In conclusion we wish to state that our investigations fully affirm the results and findings of von der Heide in almost every particular.

I wish to thank my associate Dr. Joseph Bakst who was in charge of these experiments during my absence. Also to Dr. Elsie Fox for reviewing the literature in connection with these

investigations, to the members of the House Staff and nurses who so willingly cooperated with me in recording all the details observed in the entire series of our experiments.

154 HENRY STREET.

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## MODERN METHODS IN CESAREAN SECTION.\*

BY

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MR. Chairman, Members of the McDowell Medical Society, Ladies and Gentlemen:

I am sure you will not expect me to live up to the glowing introduction which your gracious chairman has given me. Whether I have performed more Cesarean operations during the past year, or at any time, than any other one surgeon in America, as he states, I am unable to say. If I have operated only when there was just and necessary cause and by this operation have quickly stopped the mother's suffering and removed her from a condition of great and imminent peril to one of safety from which, in the large majority of cases, she is restored to health and usefulness with her uterine supports unimpaired, and her birth canal uninjured, without greater delay than that following a normal labor, if I have delivered babies whole and sound before they have been subjected to the dangers and compression of long labor or instead of being injured and mutilated and in some instances dismembered and destroyed by instrumental or other forms of vaginal delivery, I have done only that which other surgeons are doing all over the world to-day—because we have applied modern methods in the Cesarean operation.

I have experienced the feeling which has already been expressed here by others several times to-day—that when the invitation came to address you at this meeting, it was equivalent to a command to lay aside all personal duties and obey the call; I am glad to be here. Will you permit me to appear before you, not in a personal capacity, but rather as a delegate from a body of earnest co-workers in the Lying-In Hospital of New York, to pay the full measure of honor to this pioneer surgeon? for we are met to commemorate a signal event in the history of obstetrics;

\* Read at the Richmond Memorial Celebration, Newtown, Ohio, April 22, 1912.

to reaffirm the honor and the credit due to Dr. John L. Richmond, who, on April 22, 1827, performed and later reported the first authentic Cesarean section in America.

\*As we read his clear account we are impressed that this was an heroic act of a great man which rivals in its successful outcome the best achievements of our own day. He states that he arrived late in the evening at a new unfinished log cabin, surrounded by flooded low-land seven miles distant from his home. There was no floor or chimney in this cabin and the spaces between the green logs had not been chinked so that blankets had to be held up to keep the wind of the stormy night from blowing out the candle. Two midwives were present ministering as best they could to a young woman who had been in active but ineffectual labor for thirty hours, uterine contractions were frequent and forcible, each pain ending in a convulsion. Exhaustion and a failing heart were evident. From the scant stock of medicines which he had brought and with such means as the cabin afforded he at once set about to give relief from this condition. Examination revealed a deformity of the soft tissues of the birth canal which rendered delivery by the natural passage impossible. Distance, the storm of the night, the flooded country and streams and the late hour made aid from fellow doctors unobtainable. Thus alone, weighed down by the sense of such responsibility as can be known only through experience, for the safety of the two lives entrusted to his keeping, he studied and mentally struggled and prayed and finally decided that only immediate Cesarean section offered any hope for the life of either mother or child. This operation had not been done in America. He must have been aware of the fact that in Europe the mortality following it ranged from 60 to 100 per cent. His experience in abdominal surgery was very limited. The use of ether as a general anesthetic was not discovered until nearly twenty years later and antiseptic and aseptic technic had not been heard of. His equipment was an ordinary pocket case of instruments. He operated deliberately and as need arose, with courageous discrimination, he decided that a childless mother was better than a motherless child and he acted accordingly. He states that he waited for the blood to cease flowing, and then emptied the uterus. Anxious to know the true nature of the obstruction, he made bimanual examinations with a freedom which shocks our ideas of aseptic precautions. He closed the wound with

\*Otto Juettner, A. M., M. D., *Cincinnati Lancet-Clinic*, January 27 1912.

stitches and adhesive straps allowing for drainage at its lower end, but we note that he does not say that he sewed the uterus. The child was lost but the mother recovered and went about her accustomed work on the twenty-fourth day, and five weeks from the day of the operation she walked a mile and back. Such was his achievement. It is for this that we are met here to-day, to do him honor and to perpetuate and spread his fame. Modern methods have not been arrived at suddenly, but by a process of development. They have come because great necessity has arrested the attention and forced men like Richmond, Holmes, Semmelweis, Morton Pasteur, Lister and an army of other great and brilliant minds to think and act and speak, until to-day we have modern surgery, which may be old fashioned to-morrow, as it is tending ever toward simpler methods and nearer to direct and better results. A score of years ago the surgeon who had successfully performed one or more Cesarean sections was justly entitled to distinction. Now this operation may be done three or four times a day in a large hospital service without causing particular comment. Often as it is now done, we are firmly convinced that with it in the hands of experienced and conscientious surgeons, a vast amount of sorrow, suffering and invalidism would be avoided and many lives saved if it were done much more often than it now is. To the so-called Saenger method, which, however, was first conceived and used by Prof. Kehrer\* of Heidelberg, and had for its object the closing of the uterus with three layers of stitches, and the application of Lister's antiseptic methods, we owe a decided advance and the revival and greatly broadened application of the Cesarean operation, resulting in lowering the infant and maternal mortality to a degree which had never before been approached. Formerly it must have been easy to decide in which cases this operation should be done for it was held to be justifiable only as a last resort, when the birth canal was so obstructed that the child could not be delivered even piecemeal. Now this is an operation of election in many cases, coming into competition, in difficult labors with other forms of operative delivery, such as high forceps, accouchement forcé, which means some method of forcibly dilating the birth canal quickly and delivering the child with forceps as by turning and extracting it by the feet, or dividing the bones of the pelvic girdle with a saw where that is contracted

\* Henry Schwarz, Transactions, American Association Obstetricians and Gynecologists, 1910.



and delivering by forceps or turning the child, or finally, the so-called vaginal Cesarean operation, which means the separation of the bladder upward from the uterus and splitting the anterior portion of the neck and lower part of the uterus from below upward and delivering the child through the vagina. We have had experience with all of these operations and believe they have a place which is legitimate but very limited. Internal podalic version and (breech) extraction by the feet should be added. Each of these methods calls for delivery of the child through the vagina, often accompanied by such extensive lacerations of the mother that no skill known to surgery is equal to wholly repairing them, and the children so delivered are often subjected to such forcible manipulation, compression and injuries that we marvel that any survive. We firmly believe that in many instances the results of prolonged labor or some form of forcible delivery express themselves in later years in the incompetent or otherwise mentally or physically incapacitated child.

The abdominal Cesarean section leaves the mother's birth canal whole and uninjured, for it calls for a clean-cut, sharply defined wound in the uterus which is wholly under the control of the surgeon. The children so delivered, except in the neglected cases, are subjected to no pressure and are much better off than children delivered by the easiest normal labor. Too many times we have had cause to regret delivery by one or the other of the aforesaid methods. Seldom have we had cause to believe that we had made an unfortunate choice in electing abdominal Cesarean section.

#### THE TECHNIC OF THE OPERATION.

A method which, though by no means perfect, has given the writer considerable satisfaction in 120 Cesarean operations is as follows: The patient is completely anesthetized, preferably with ether, and placed horizontally upon the operating table. The preparation of the abdomen in the matter of cleansing is the same as that for any abdominal operation. It is then covered with sterile sheets except at the site of the operation. An opening about 3 1/2 inches in length is made in the abdomen in the mid-line from the navel upward. The upper front part of the pregnant uterus appears under this wound. Gauze pads wet in warm salt solution are placed in the abdomen

above the uterus to hold the intestines back and prevent their escape through the abdominal opening. An assistant now makes pressure externally with a hand at each side of the abdomen crowding the front of the uterus up against the abdominal opening, rotating it if necessary so that it looks directly forward. This maneuver is in no sense to control hemorrhage. The operator opens the uterus by an incision a little longer than that in the abdomen from just below the top of the uterus down its front mid-line, endeavoring to avoid cutting through the sac of waters. This sac should now be separated all around from the surface of the uterus with the hand. If, as in Dr. Richmond's case, the afterbirth is under the opening in the uterus, the hemorrhage from that source is considerable and we are obliged to cut or tear directly through it. The child is delivered by grasping the thigh which is in front, pulling it out and continuing traction upon it, following much the same plan as in breech extraction by the vagina. The cord is caught by an assistant with two long clamps. It is cut between the clamps and he takes the child away and induces respiration the operator hooks two fingers of his left hand into the uterus at its upper part and holds it up near the abdominal opening. He then places a deep stitch of number 2 chromic catgut at the upper and another at the lower angle of the wound in the uterus and ties them and leaves the ends long. The first assistant now discontinues pressure against the abdominal wall and holds the uterus up by these sutures. The operator passes his hand into the uterus and removes the afterbirth, membranes and clotted blood. The method of sewing the wound in the uterus has always been considered important. Various plans have been tried. That which has given the writer greatest satisfaction has been employed by him in the last thirty operations. Usually only two layers of stitches are used, but occasionally where the wall of the uterus is tightly contracted and thick, a running stitch of fine catgut, like that used in basting, is employed to bring the deepest edge of the cut surface of the uterus together. Sometimes this stitch includes the inner lining of the uterus, the endometrium, without apparent harm. Ordinarily, independent stitches of number 2 chromic gut are passed through and within  $1/8$  inch of the cut edge of the outer or peritoneal covering of the uterus, down through the muscle, but not through the inner lining of the uterus, and out in reverse order on the opposite side. These stitches are drawn so as to hold the cut surfaces of the

uterine wall close together through the whole depth, but not tight enough to constrict the tissue and make it white; they are tied in three knots and cut short to the knot so that they can be readily covered entirely by the next layer of stitches. They should be about  $1/3$  inch apart. The next layer is a continuous or running stitch of number 1 chromic gut. Beginning at the lower end of the wound in the uterus it is passed through the peritoneum and tied; this knot is covered and then by passing the needle alternately on one side and then the other close to the wound and parallel to it, the peritoneum covering the uterus is caught up and folded over the wound entirely covering the first layer of stitches leaving no raw surface upon which adhesions may form and no sharp ends of stitches to injure intestine or peritoneum. The uterus is now allowed to take its place in the lower part of the abdomen well removed from the abdominal opening with no possibility of the wound in the uterus and that in the abdominal wall coming into contact and growing together as was not infrequently the case when the abdomen was opened by the long incision low down. The gauze pads are removed and the abdominal wound is closed in three layers. An ordinary sterile gauze dressing is applied, held in place by adhesive straps. The adhesive straps which are placed transversely over the abdominal wound should be tight. Elsewhere, all dressings, straps and binders should be loose so that the abdominal wall is not compressed against the uterus and the uterus is allowed free play in the lower abdomen. The patient is placed in bed with the head of the bed elevated to favor drainage, and descent of the uterus. There is usually some abdominal distention and pain for the first forty-eight hours like that in any abdominal operation. The mother nurses her child and in hospital cases if there are no complications, she sits up in a chair on the eighth day and is discharged from the hospital on the twelfth day. The writer finds that during 1911, four of his Cesarean patients left the hospital at their own request with living babies and in good condition on the tenth day after operation.

The accompanying photograph shows four women who were delivered by Cesarean section in March, 1911 by the method above described by the writer. They are all about twelve days postpartum. Attention is called to the cicatrix of the high incision above the umbilicus and also to the traced outline of the uterus in the lower part of the abdomen in each case.

The chief dangers from this operation are:

1. Delay in operating.
2. Infection from vaginal examinations or attempts at delivery without due regard to surgical cleanliness.
3. Hemorrhage.
4. Complicating diseases which place the patient's life in danger regardless of what operation is done and before any operation has been attempted.



The second and first causes given in order or a combination of these two, but chiefly the second, cause the most of the maternal deaths following Cesarean operation. It is very rare for a woman to die from hemorrhage in this operation, though hemorrhage sometimes places them in jeopardy. Taken as a class, patients requiring Cesarean operation are below par physically with lowered recuperative powers and often their progeny are sharers in this.

The writer offers the statistics of his personal Cesarean cases—because they are conveniently at hand, and he is familiar with



them. They are fairly typical except that the maternal mortality is high because he has operated upon some cases that were about to die and others that were badly infected before they came to him. He has sterilized only two women following Cesarean section. To-day, 4 per cent. maternal mortality in clean, uncomplicated cases of Cesarean section is high.

Since October, 1911, the writer has performed thirty Cesarean sections which have not been reported. One hundred and four of his cases were reported in *Surgery, Gynecology and Obstetrics*, Chicago, October, 1911. His total list is as follows:

Number of Cesarean operations.....	134
Mothers lived and discharged from the hospital.....	117
Mothers died.....	17
Number of children delivered (twins twice).....	136
Number of children lived and discharged alive from the hospital.....	112
Number of children still-born or died before discharge from the hospital.....	24
Number of children still-born.....	9
(Twins, once; another too young to be viable).	
Number of children born alive but died before discharge from the hospital.....	15

Day of death of these fifteen, was one on the second, two on the third, one on the fourth, one on the fifth, one on the eighth, two on the tenth, one on the fifteenth, one on the eighteenth, one on the twenty-third, one on the twenty-fifth, one on the twenty-eighth, and one on the fifty-fourth day after delivery.

The indications for the operation were:

Contracted pelvis in.....	100 cases
Tonic contraction of the uterus and dry labor.....	4 cases
Prolapse a cord and undilated cervix.....	2 cases
After ventral suspension.....	4 cases
Placenta previa.....	3 cases
Pneumonia (patient moribund).....	1 case
Accidental hemorrhage (mother survived, child still-born).....	1 case
New growths.....	6 cases

## CAUSES OF DEATH OF MOTHERS.

Septic infection.....	10 cases
Only two of these were wholly under the care of the operator; eight had outside examinations or attempts at delivery.	
Acute dilatation of the stomach, anesthesia.....	1 case
Shock and slow persistent hemorrhage, third Cesarean.....	1 case
Pneumonia.....	1 case
Eclampsia.....	4 cases
Children born to mothers who died.....	18 cases
Nine of these lived; nine died; (two were still-born).	
Tonic uterine contraction.....	4 cases
Number of children born (twins twice).....	5
Mothers lived.....	3
Mothers died.....	1
Children lived.....	1
Children died.....	2
Children still-born.....	2
Prolapse of cord.....	2 cases
Number of children born (twins once).....	3
Mothers lived.....	2
Children lived.....	3
After ventral suspension.....	4 cases
Mothers lived.....	4
Children lived.....	4
Placenta previa.....	3 cases
Number of children born.....	3
Mothers lived.....	2
Mothers died (sepsis and heat prostration).....	1
Children lived.....	2
Children died.....	1
(Child of mother who died.)	
Pneumonia (antepartum).....	1 case
Mother died in twelve hours; child died on fifth day.	
Accidental hemorrhage.....	1 case
Mother lived.....	1
Child still-born.....	1
(Dead before operation.)	
Eclampsia.....	13 cases
Children born (twins twice).....	15
Mothers lived.....	9
Mothers died.....	4

Number of children discharged alive from hospital.....	11
Number of children died before discharge.....	2
One on eighth day and one on twenty-third day.	
Number of children still-born (twins).....	2
(Dead before operation.)	
Number of children born to mothers dying of eclampsia.....	5
(Twins once.)	
Number of these who lived.....	4
Number of these who died.....	1
New growths (fibroid tumors, cancers, etc.).....	66 cases
Number of children born.....	6
Mothers lived.....	6
Children lived.....	4
Children died.....	2
One from hemophilia on the fourth day; one child not viable.	
Repeated Cesarean section in same patients:	
Number of cases.....	21
Number of second operation....	15
Number of third operation.....	5
Number of fifth operation.....	1
Number of mothers surviving second operation.	13
Number of mothers surviving third operation....	4
Number of mothers surviving fifth operation....	1
Number of mothers died after third operation....	1

The most favorable time to operate is just before or soon after labor begins. This insures a full term child, which has not been compressed, the mother has not been exhausted or infected. It is not necessary to wait for dilatation of or to forcibly dilate the cervix; after the operation, the cervix becomes soft, relaxed and open for ample drainage. This we have seen repeatedly, especially in cases not at full term and not in labor, as in eclamptic patients.

Hemorrhage must come from either the cut surface of the uterine wall or the placental site. Uterine contraction is favored by injection deep into muscles of 25 minims of ergotole half an hour before operation. The hemorrhage from the uterine wall is controlled before delivery by compression with gauze pads.

At delivery the operator's hand and wrist and later the child's body holds it in check. After delivery of the child, by hooking the fingers into the uterus and pulling upward, the sinuses will flatten and close and cease to bleed. That at the placental site is usually temporary; if severe, a sterile towel packed down upon it will check it. The insertion and tying two or three deep sutures is of great service in stimulating uterine contraction. In many cases the hemorrhage calls for no attention whatever.

Ruptured uterus occurred twice in 134 operations in patients who have previously had Cesarean section. Both mothers and both children survived. Both mothers neglected to come to the hospital until they had been long in labor—thirty-six to forty-eight hours. One of these patients was sterilized by resecting the tubes; one other patient who had extensive adhesions was sterilized.

In cases of contracted pelvis, we must consider the relative size of the pelvis to that of the child's head and its moldability rather than to rely too confidently upon pelvic measurements.

The advantages of the small abdominal opening in the mid-line wholly above the umbilicus are:

1. It passes through no important structures in the mid-line but opens the abdomen at a point where the tissues are normally thin and elastic late in pregnancy.

2. While a wound 3 to 4 inches long through this elastic tissue is ample for the delivery of the child and all necessary manipulations, it is, nevertheless, a small opening which does not allow the ready escape or undue manipulation and exposure of the abdominal contents.

3. After the operation there is no possibility of adhesive union between the wound in the abdomen and that in the uterus.

4. Hernia is less liable to occur in the high abdominal scar because it is above the location of greatest strain in the abdominal wall. We never have seen hernia following this method of operating.



INDICATIONS FOR ABDOMINAL CESAREAN SECTION  
WITH THE TECHNIC OF THE OPERATION  
AND ANALYSIS OF 352 CASES FROM  
THE WARDS OF THE NEW  
YORK LYING-IN  
HOSPITAL.\*

BY

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CESAREAN section has labored under the disadvantages of both a traditional and a sentimental prejudice due to its early history. As long ago as 1752 Mauriceau of Paris wrote: "It is a damnable policy martyring and killing the mother to save the child; it is better that a living child be killed by embryotomy rather than to resolve upon the cruelty and barbarousness of the Cesarean section in which it is utterly impossible that a woman should escape."

In Great Britain this prejudice was as great as it was in France and for seventy years following these words of Mauriceau there were very few Cesarean operations in that country and of the few undertaken all proved fatal except one.

Scarcely more than a decade ago Cesarean section was still considered an operation of doubtful expediency to be advocated only in cases where the birth of a living child was believed to be impossible and after all other forms of delivery had been tried. As a consequence, it was performed upon women exhausted with other attempts at delivery; often after infection from manipulation; and with incomplete asepsis. The result is that Cesarean section has been put upon the defensive in order to prove itself under certain conditions an operation of choice and it has even been forced to show a return of favorable cases with an average success higher than that demanded for other operative measures.

Fortunately such a resultant success has been achieved as to enable us to state at the onset of this discussion that if "certain cardinal principles" are carried out, the prognosis for life and

\* Read at the Annual Meeting of the New York State Medical Society, Albany, April 18, 1912.

after-health for both mother and child is absolutely favorable in Cesarean section. What those cardinal principles are and what are the indications demanding the operation, will be the endeavor of this paper to show. At the present stage of technic, it may be fairly said that where the mortality is high, conditions exist which are inimical to the "cardinal principles" demanded for it.

Hitherto we have been wont to ask ourselves whether the patient could reasonably be delivered by any other method; now, however, we are asking: "is not Cesarean section the safest method of delivery for certain cases?"

Many authorities have scarcely any doubt at present of the ultimate substitution of other methods of delivery for that of high forceps. Reuben Peterson goes so far as to say that the "time is coming when the operation of high forceps will not be taught in our medical schools as an obstetrical operation." He is convinced that Cesarean section gives far better results.

If physicians undertook Cesarean section with the careless technic and lack of asepsis often used in high forceps operations the mortality would be appalling. Many forget that the use of high forceps in delivery needs greater technical facility on the part of the operator than is demanded for most other operative procedures. The serious sacrifices of life; the relaxations and displacements of pelvic organs, and the tears of the birth canal from forceps are in most instances inexcusable.

Two factors of vital importance for the increasing success of abdominal Cesarean operations which have been well brought out by A. B. Davis of New York, are sufficiently early antepartum examinations and freedom from previous attempts at delivery. This, it should be repeated, is no new appeal since Cazeaux writing long before asepsis was known and thirty-five years before even an early effective antisepsis, deplored the ill effects of prolonged labor, rupture of the membranes, and attempts at vaginal delivery before undertaking Cesarean section.

There is still a proneness to adopt Cesarean section only after examination by several physicians and when all other methods have been tried and failed. And it is not too much to say that this reluctant attitude of physicians ought to disappear so that a timorous and belated acquiescence in an operative procedure which should have been one of election shall not negative its best results. It takes no argument to prove that such an attitude

merely opens the door to the two most dangerous deterrents to success: exhaustion and infection of the mother. Both of these inimical conditions may reasonably be avoided if there be an adequate antepartum examination at a sufficiently early stage to insure the performance of the operation under the conditions and at the period most favorable for recovery.

There are a number of cases of ruptured uteri in this series of 352 which might have been avoided if examination at a proper time had been made. As it was, the lack of intelligent cooperation on the part of the outside attendants permitted the patient to go into active labor many hours before seeking hospital assistance. One of these was a case of thirty hours of labor before operation and another a case of contracted inlet and exostosis, with a previous Cesarean history—the only case of repeated section where the old wound was ruptured. It may be said emphatically then that the eleventh hour is not the best time in which to decide upon the treatment to be chosen for delivery and that many craniotomies, unfortunate complications, even serious injuries and deaths may be avoided if the accoucheur has a certain and well-defined knowledge of the conditions to be expected.

While this statement is of general importance to the entire subject of accouchement, it is of very grave importance for the success of the Cesarean operation. It is conceded by many operators at the present time that if from the results of an antepartum examination the operation has been determined upon at the onset or before labor, a 2 per cent. mortality may be expected and if after two hours of labor in the second stage, 4 per cent.

Having given considerable space to the consideration of the preliminary precautions governing the operation of abdominal Cesarean section, it will be well to concern ourselves with the indications which upon examination will appeal to the wise surgeon as those which point to its choice.

*Indications.*—The reader's own list of the indications for Cesarean section is condensed into the following category of six. It differs very little from certain other lists which are more expanded and contain no data essentially different. For the sake of the simplicity of the briefer classification it is here repeated. The indications are:

1. Deformed pelvis.
2. Disproportionately large child.

3. Placenta previa.
4. Eclampsia with partially dilated cervix, complicated or not with other causes.
5. Neoplasms of the uterus such as fibroids, carcinomata, etc.
6. Vaginal deformities such as marked contractions from scars, etc.

1. *Deformed pelvis*.—Taking these up in order as given, we find that of the 352 cases in this series, exactly twenty were recorded as having a normal, large or roomy pelvis and forty-eight were "not noted," indicating probably no marked lapse from normal; therefore in 284 or nearly 78 per cent. some form of deformed pelvis was present. By deformed pelvis we mean any kind of pelvis which is so misshapen or contracted as to hinder the passage of a living child through it.

It has been stated that about 60 per cent. of all cases of this kind are liable to delivery by spontaneous methods; but slow dilatation and prolonged labor expose the patient to serious danger of infection on account of the lessened resistance due to exhaustion. As many as 26 per cent. will have premature rupture of the membranes, a condition bad for the child as asphyxiation may be caused by placental circulatory interference and the pressure of the presenting part upon a prolapsed cord is a frequent cause of death in spontaneous delivery with a deformed pelvis. "The repeated delivery of dead children in cases of contracted pelvis is unjustifiable and indicates a neglect of human life which should not be tolerated."

In the 128 cases recorded in the series now under consideration the true conjugate was under 8.50 cm., in eight cases, 7 cm. and in three cases 6 cm. or less. Where the true conjugate is 8 cm. or less after careful antepartum measurements, the patient should be sent to the hospital for Cesarean section.

The general shape and contour of the pelvis is as important an indication for Cesarean section as the measurements of the conjugata vera; for we now know that such irregularities as those of the Roberts type on account of the lateral contraction of the sides also render delivery by the vaginal route impossible although the true conjugate may be longer than normal.

The varieties of deformity considered in this series are in the following order according to the frequency of their occurrence.



Justo minor.....	91
Contracted.....	41
Simple flat.....	37
Rachitic, with or without some of the other forms of contraction.....	31
Funnel-shaped.....	13
Nägele.....	8
Deformed from hip disease.....	2
Kyphotic.....	1
Osteomalacic.....	1
Spondylolisthetic.....	1
Deformed and contracted in several ways at once.....	57

This does not bear out the statement of Whitridge Williams that funnel-shaped deformity is the most common abnormality among white women and constitutes 44 per cent. of all deformed pelves.

2. *Disproportionate Size of Child*.—Even in cases where there is no malformation and the true conjugate is greater than that demanded by certain authorities, there will still remain the factor of disproportion of the size of the child to be born. In this series there are seven cases where the indication for the operation was a child too large for delivery *per vias naturales* and four of these cases were among the few normal or not noticeably abnormal pelves.

3. *Placenta Previa*.—Twelve cases of placenta previa out of 350 is a disproportionate amount for any but an operative and emergency series as the largest estimate given for general hospital practice is one case of placenta previa to every 207 births.

In Novak's 2081 cases reported by different authors as treated by methods other than Cesarean section, the average maternal mortality was 8.65 per cent. and the fetal mortality 56.72 per cent.

Edgar's analysis of forty consecutive cases treated by version and breech extraction, simple breech extraction, forceps, and spontaneous delivery show a slightly lower maternal mortality, 7.5 per cent. and an infant mortality of 32.35 per cent. This was considered satisfactory as half of these were ambulance and emergency cases.

In a previous series of placenta previa cases analyzed by the present speaker and treated in various ways, but showing less

than 1 per cent. of Cesarean section operations, the percentage of deaths for the children was about the same as that quoted from other authorities. Here as elsewhere the situation was complicated by the fact that moribund mothers were brought in from the ambulance having had no examination of their condition early enough to prevent hemorrhage and shock from destroying "all but the most robust of infants."

A series of twelve is too small for a valid percentage but the maternal mortality in this series, treated by Cesarean section alone was one out of twelve or 8.33 per cent. This mother died of general sepsis on the seventeenth day. The fetal mortality was three—with two still births. This is 25 per cent., a better showing than usual. Davis of Philadelphia thinks that in the present state of our knowledge there is no treatment to be compared with Cesarean section for central placenta previa *if the life of both mother and child* are to be considered. The high fetal mortality by vaginal treatment and the considerable maternal mortality seem to the speaker that Cesarean section will become to a greater extent the operation of choice.

Certain authorities believe that the indications for abdominal section in placenta previa should be an undilated cervical canal and tissue hard and unprepared for artificial dilatation. This condition exists in about 5 per cent. of cases, almost never in multiparæ. Further indications for multiparæ are to be found in those with cicatricial stenosis of the cervix or marked degree of contracted pelvis.

It is simpler to state that the ideal conditions for delivery of placenta previa by Cesarean section are to be found in a rigid cervix, a viable child, and a mother who is a good surgical risk with diagnosis made early. Treatment without Cesarean section shows a frequent fetal mortality as high as 50 to 60 per cent. In the series now under consideration deformed pelvis was present in four cases, complicated in one instance with persistent bleeding.

4. *Eclampsia*.—New proof derived from Peterson's exhaustive study of the treatment for eclampsia emphasizes our former belief and statement that immediate emptying of the uterus is the treatment demanded. "Putting an end to pregnancy stops the intoxication since it depends upon pregnancy" is a dogma which we all wish were true. In any event it seems to be a creed defensible from a pragmatic standpoint. The inactive policy which is somewhat natural to the obstetrician who is perhaps

justly conservative in his methods may be and usually is the worst possible treatment for eclampsia.

Peterson's 500 cases were gathered from 100 different operators and from twelve countries and his general results are of primary importance. The average mortality in eclampsia is 28.9 per cent. When there are no postpartum convulsions the mortality is 10 per cent.; the general mortality decreasing in any series and by any treatment according to the lessening number of antepartum convulsions. After ten antepartum convulsions the mortality takes a great leap upward.

"No physician can save life where the intoxication has extended to the kidney, liver and brain of the mother with such serious degenerative changes as often occur before the first convulsion." In operations immediately after the first eclamptic seizure, the mortality is as low as 18.51 per cent., the fetal mortality of course, also depending upon the amount of intoxication which has extended to the fetus. A higher mortality for the children may therefore be expected after many antepartum convulsions. While spontaneous delivery gives a low death rate for the child, the general conclusions from this long list of cases is that the necessity to empty the uterus promptly is indicated as a necessity in eclampsia.

In our series there were twenty eclampsia cases and the maternal mortality was five—or 25 per cent.—only a little higher than Dr. Peterson's taken from twenty-five times as many cases, necessarily a much fairer method of calculation. The fetal mortality in this series of twenty was three, one still-birth and one child dying on the fourth and one on the eighth day after birth. But according to fair testimony a fetus showing no signs of life at time of operation cannot be included, therefore we have found only two deaths of children—or 10 per cent.—a better showing than can be found in any other regular series by whatsoever treatment. Probably a cause for the lessened fetal mortality lies in the decreased traumatism due to high delivery and without instruments.

Dr. Peterson's figures show that the eclamptic conditions are present more frequently in primiparæ but that the mortality is higher among multiparæ. The ratio in these twenty cases was about the same for both, as there were twelve primiparæ with a mortality of three; and eight multiparæ with a mortality of two, twenty-five per cent. each time.

Fourteen cases were complicated with deformed pelvis or with

ruptured membranes or with both. These are facts of some significance, as a widely accepted indication for the abdominal Cesarean section is the complication of a deformed pelvis.

5. *Neoplasms*.—Neoplasms were of various kinds, fibroids, carcinoma, sarcoma and pelvic tumors. There were eighteen cases in all with a maternal mortality of five and a fetal mortality of seven. One of these cases of carcinoma died from shock after hysterectomy following the Cesarean section and one from the obstruction of a large fibroid tumor. In two cases of large fibroid, the mother died in one instance from shock and the child in the other from hemophilia. In the two other deaths from neoplasms one was from suppression of urine and the other from general peritonitis with a history of outside manipulation before admission.

6. *Vaginal Deformities*.—Constituted no large part of this series; but atresia of the vagina was the indication in several cases. Membranes ruptured prematurely in 165 cases. Of these a deformed pelvis was frequently an accompanying feature and sometimes a deformed pelvis with other complications. In one case there was an exostosis; in two, fibroids of the uterus. There was also one case of double monster, one of twins with prolapsed cord, one adherent cervix, and one of Pott's disease. Impacted shoulder and transverse presentation at one time with eclamptic complications and two placenta previa cases were accompanied by ruptured membranes. The entire mortality where there were prematurely ruptured membranes was: maternal, nineteen, 11.5 per cent.; and fetal, thirty-one, 15 per cent.; fourteen stillborn.

Out of the 165 cases where the history was merely one of prolonged labor, deformed pelvis and ruptured membranes, the mortality was twelve, 7.2 per cent. In all of the other cases, neoplasms, eclamptic complications, or other morbid concomitants were obviously present as a cause of death.

The entire mortality for the 352 cases is: Mothers, thirty-eight; children fifty-three. Of the latter twenty were stillbirths.

There were twelve maternal deaths where there had been outside manipulation and infection; causes of death being general sepsis, streptococcemia, staphylococcemia, in one case combined with spinal meningitis. One mother was brought in from the ambulance in shock with a ruptured uterus, the stillborn child was taken from the abdominal cavity. In one case the mother died on the table before the abdomen was opened. One



case where lobar pneumonia was the reason for undertaking the operation both mother and child died, the mother on the first day and the child on the fifth. Five deaths were due to eclampsia; five to neoplasms; one to Pott's disease where the mother was moribund and the operation was undertaken solely in behalf of the child who lived; four died of pneumonia; and one of pulmonary embolism. There were eight cases of shock, three from hysterectomy following Cesarean section, two from neoplasms and one from peritonitis. Eliminating only the moribund cases, where the mother's case was hopeless at time of operation and including general sepsis from outside previous attempts at delivery, pneumonia, eclampsia and neoplasms in our series, we have a mortality of thirty-three or 9.6 per cent. maternal mortality.

The fetal mortality of fifty-three included one double monster stillborn, one child of a hump-backed dwarf which died of inanition; one case of asphyxiation due to protracted labor. There was a case of atelectasis and one of nephritis and the case where the stillborn child was taken from the abdominal cavity of the mother brought in in shock from ruptured uterus. The fetal mortality with the four obvious cases removed amounts to 14 per cent.

*Multiple Cesarean Section.*—There is always an interesting question attached to the repeated operation. In an estimated table given by McGibbon of Edinburgh we find that out of 150 cases taken from a New York list where multiple section had occurred as many as five times in two cases, four times in one case, three times in thirty-two cases, the mortality was 5 per cent.

The earlier table of thirty-nine cases given by the present writer showed three deaths, one of which, however, dying of anesthesia before the abdomen was opened, gave about a 5 per cent. mortality. In that series the two other maternal deaths were from complications of general sepsis and pneumonia. There was practically no fetal mortality in that series.

Out of the forty-four cases in our present series there were two deaths; one of paraplegia from Pott's disease and one from peritonitis, making at most a little more than 2 per cent. McGibbon does not agree with Keer of Glasgow, who sterilizes all women after the second Cesarean section. Olshausen has found only one case out of 120 where rupture occurred from repeated section. Covelaire thinks it occurs in about 2 per cent. of cases.

In our series there were eight cases of Cesarean for the third time, two for the fourth, one for the fifth and there was but one case of rupture from the old wound.

Harrar of our staff has recently published an article stating that the place where uterine tissue may rupture is between the scars, should successive scars be made. The uterine scar may be perfectly healed itself making strong tissue but at every new section it should be cut out and a new line of cleavage made, with no possibility for weakening tissue between scars. In the previously mentioned thirty-nine cases the uterine scar had disappeared from sight in nine cases and was normal (no thinner than the rest of the uterus) in twenty-five cases.

*Technic of Operation.*—The various analyses which have been undertaken in this paper thus far, have emphasized the desirability of examination before labor. In emergency and ambulance cases, we are face to face, however, with conditions instead of theories.

Whenever possible we have waited for the mother to go into labor before commencing the operation, in order that some dilatation of the os might occur, thereby facilitating drainage in the puerperium and determining whether or not the head would engage.

The technic, consists after the usual preparations for any laparotomy, in opening the abdomen by an incision about 12 cm. in length, slightly to the right of the median line and extending *downward to the umbilicus from above*. One or two gauze pads wet in warm salt solution are placed above the fundus which will be found directly under the wound, in order to hold back the omentum and intestines. The frequent twisting of the uterus upon its long axis, especially to the right makes it desirable to rotate to the left, so that its anterior wall looks directly forward thus bringing the uterine incision in the middle of the organ. The assistant so regulates pressure on the sides of the abdominal wall that the uterus is held well up to the abdominal opening until it is emptied of its contents—child, placenta, and membranes and until several of the deep sutures are in place and tied. No effort to control hemorrhage has been made as it has been found to be unnecessary. The uterus is carefully opened with a scalpel in order to keep the membranes intact, and the hand should be swiftly swept around between them and the uterine wall so that later when the uterus has contracted there will be no delay in removing the adherent membranes. Neglect

of this precaution may mean that the membranes must be removed piecemeal. The anterior thigh of the child is grasped and a breech extraction is done whenever possible, turning the child after delivery of the shoulders so that it faces toward the mother's face. An assistant stands ready to clamp and cut the cord and the child is taken away to another room to have respiration established. The placenta and membranes are next extracted and we then hook two fingers of the left hand into the uterus at the angle of the wound and with the right hand pass the deep interrupted sutures of No. 2 chromic catgut through the cut edges of the uterine wall down to the endometrium and well out on the opposite side in reverse order.

These sutures are readily buried by a continuous suture of No. 2 plain gut placed so as to pass through the peritoneum, well into the muscle and fold it over the first layer of stitches much in the manner of a Lembert suture, bringing the peritoneum into apposition.

The abdominal pads are removed; the wound is closed in layers as in an ordinary celiotomy. The after-care in uncomplicated cases is that of any laparotomy together with that of an ordinary postpartum case.

In all of this it is understood that the uterus is not delivered from the abdominal cavity. The lessened mortality from the operation in its new technic owes much to the fact that shock is decreased under these circumstances and that there is less danger of infection.

*Summary.*—To sum up rapidly the results of this analysis, it seems to be evident that:

1. Cesarean section is the preferred method of delivery under conditions where a viable child may not be delivered by normal ways and provided the mother can bear the surgical risk.

2. The mortality statistics show that early examination, freedom from previous manipulation and from other efforts to deliver, are important points for the best results.

3. However the fact that the patient has been some time in labor need not preclude the efficiency of the operation.

4. Conditions should be satisfactory for this operation as it requires a particular technic with skilled assistants for the best results.

5. The most important points of the technic are:

- a.* High incision.

- b.* Nondelivery of the uterus from the abdominal cavity.

c. The absence of any method of constriction to prevent bleeding. This is not necessary.

d. The method of suture as described above.

6. Given such conditions as are demanded for the technic of the operation, and with the elimination of those patients who would die under any method of treatment, we may hope for a mortality not to exceed 2 per cent.

20 WEST FIFTIETH STREET.

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## MENSTRUATION WITHOUT OVARIES.\*

BY

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MAXILLIAN NEU (*Zent. f. Gyn.*, No. 10, 1911), in writing of so-called "pseudomenstruation" records his observations in fifty-four cases in which both diseased ovaries were wholly removed. He observed that in every instance in which the ovaries were removed fourteen or more days after the last menstrual period, that a menstrual flow occurred shortly after the operation and resembled in duration and amount the regular menstrual flux, but where the operation was performed in less than fourteen days after the last menstrual period there was no loss of blood following the operation. He believes that these hemorrhages were not accidental, but were regular menstrual hemorrhages.

The statistics of Straehl, Schmalfuss, Widdow, Glaveke, Nernes, Liesan and Pfister show that the menses return for a variable number of times after double ovariectomy in from 2.7 per cent. to 24.4 per cent. of all cases or an average of 12 per cent. This percentage would be increased were the occurrence of vicarious menstruation included. Pfister, in 116 cases of double castration, had twelve cases in which hemorrhages from the nose and bowel recurred at regular intervals over a period of one to two years. According to Pfister, 30 per cent. and Glaveke 50 per cent. of all castrated cases experience the menstrual molimina for two or more years. In the above statistics no account is taken of the occurrence of hemorrhages from the uterus which frequently follow double ovariectomy and persists for one or more days only but do not recur at regular intervals.

My interest in the periodic recurrence of the menstrual flux

\* Read before the Am. Gyn. Soc. in Baltimore, May 28, 1912



after the removal of both ovaries was incited by the following case:

Mrs. B., aged thirty, referred by Dr. Sykes of Hamburg, Iowa, was first operated Sept. 30, 1909, by Dr. Jolly of Hamburg, Iowa, who, at that time, removed the left tube and ovary and appendix. On May 9, 1910, he removed the right tube and ovary. In both cases, the ovaries were markedly cystic and not adherent.

My relation to the case began Sept. 14, 1911, when she complained of a constant pain in the back and in the right side of the pelvis which had persisted for two or more years. She ceased to menstruate for three months after the last operation by Dr. Jolly; then proceeded to flow at regular twenty-eight-day periods. The flow did not differ from that of previous years.

On examination I found a mass about the size of a hen's egg to the right of the uterus that was tender to pressure and immovable; this I assumed to be an adherent cystic ovary resulting from a retained fragment of an excised ovary. Upon opening the abdomen, I discovered that this mass was the omentum firmly adhered to the right horn of the uterus and that there were adhesions distributed throughout the pelvis. In a careful search no trace of ovarian tissue was found. Neither of the ovarian ligaments was in evidence. I amputated the omentum high above the uterus and broke up all pelvic adhesions, leaving no raw surfaces. The uterus was normal but atrophied to about two-thirds its normal size. An exploratory curetage revealed nothing abnormal within the uterus. It is now seven months since the operation and the patient writes me that she is in good general health but that *her menstrual periods have continued to recur at regular intervals and in the usual amount.* She says she is very nervous and suffers from hot flashes. She has not taken ovarian or corpus luteum extract.

The findings in this case are almost identical with those in the case reported by Dr. George Gellhorn of St. Louis in the *Zent. f. Gyn.*, No. 40, 1907. In his case both ovaries were removed, one in 1905, and the other in 1906. She complained of pain in the abdominal scar and groin and hot flashes. She had menstruated at regular monthly intervals for seventeen months following the second operation in which the second ovary was removed. In the operation of Gellhorn, general pelvic adhesions were encountered, the omentum was adhered to the abdominal scar and fundus of the uterus by means of three solid cords which were severed. The uterus was atrophied, but otherwise appeared normal. There was no evidence of tubes or ovaries. The case was followed for six months, during which time there was no return of the menses.

It will be noted that Gellhorn's case and mine differed in only one essential detail; the menses recurred at regular monthly intervals after the operation in my case, while in Gellhorn's case, they had not recurred during the six months of observation following his operation.

Gellhorn very logically concludes that in his case the persistence of the menstrual periods following the removal of both ovaries was aided by the added blood supply brought to the uterus through the adherent omentum and that inasmuch as no ovarian tissue was found and could not possibly have been removed by him in the operation, he believes that the cyclic element was the controlling factor in continuing the menstrual periods. In his study of the case, he was careful to eliminate such casual factors as endometritis, fibroids, polypi, cancer, and general conditions, such as an incompetent heart which might result in pelvic congestion. He believes that the ovary is not the essential cause but merely a stimulus to the menstrual cycle and illustrates his point by a recital of another case in which both ovaries had been removed, the menses ceased for six months when ovarian extract was given, and in six weeks from the time ovarian extract was given, the menstrual periods began and continued to recur at regular periods so long as the patient was under observation. In this connection, it is of interest to note that Van de Velde made a number of observations in women of forty-three to forty-nine years of age in whom the menses ceased for a period of four to eighteen months and returned shortly after the administration of ovarian extract.

In a personal communication from Dr. Gellhorn, he suggests that the probable explanation for the menstrual periods persisting after the removal of both ovaries in my case is found in the formation of adhesions binding the omentum and other pelvic structures to the uterus and that possibly these adhesions recurred after the operation which I performed, thus accounting for the persistence of menstruation after my operation was performed. I do not believe that the amputated omentum could possibly adhere to the uterus, but there were extensive adhesions elsewhere in the pelvis which might readily reform. The point is well taken by Gellhorn that in a woman in the age of sexual maturity and in the absence of ovarian tissue, the menses may recur at regular intervals through the agency of the vascular connections with the uterus as existed in his and in my case, and that between the ages of twenty-five and forty

a comparatively small stimulus may suffice to bring on a menstrual flow.

It is of passing interest to note the experiments of Josef Halban (*Zent. f. Gyn.*, Nov., 1911) who studied the recurrence of rut in frogs after castration. While the rut was diminished in degree it recurred at regular intervals. These observations suggested to the mind of Halban that the genital glands are not essential to rut and he assumes the existence of some as yet unknown cause for the menstrual phenomena.

The theory that has met with general acceptance is that of the presence of ovarian tissue left behind after the removal of both anatomical ovaries. In the removal of adherent infected ovaries small bits of ovarian tissue may be easily left attached to surrounding structures and thus account for the persistence of the menstrual periods. Supernumerary and accessory ovaries form the subject of very able discussions by Dr. Manclaire and Madam Isenberg-Paperin (*Archiv. gen. de chirurgie*, July 25, 1911, and Meriel, *Paris medical*, Oct. 14, 1911). Two varieties of supernumerary ovaries are recognized: (1) contiguous supernumerary ovaries placed on or close against the anatomical ovary; and (2) aberrant supernumerary ovaries lying at some point in the line of descent of the fetal ovary or more or less removed from that line. Meriel found aberrant ovarian tissue in 4 per cent. of female bodies of all ages. These bodies were usually not larger than a millet seed or pea and rarely attained the size of a cherry. The greater number lie adjacent to the anatomical ovary but may be found in the broad ligament, ovarian ligament, pelvic pouches, under the peritoneum adjacent to the ureter, and adhered to the omentum and intestine. They are prone to develop new cystic growths just as are aberrant thyroid and adrenal bodies.

Meriel explains the occurrence of these supernumerary bodies lying close to the anatomical ovary on the hypothesis of gland division by fetal peritoneal bands. He observes that the ovary and accessory bit are separated by cicatricial tissue. The more remote supernumerary bodies are the result of peritoneal bands formed early in fetal life, before the ovary has made its descent. Or as Chipman (*Trans. Am. Gyn. Soc.*, 1911) suggests, it may be due to the persistence of the type of diffuse ovaries found in birds and reptiles.

Not only may menstruation persist after double ovariectomy but Blair, Bell, Doran, Chipman, Hoegh, Gordon and others have



reported instances in which pregnancy followed the removal of both ovaries thereby supplying proof positive of the functioning capacity of the supernumerary ovaries.

Referring again to the cause of the periodic recurrence of the menstrual periods after the removal of both ovaries, I submit that there is no convincing proof that such an event is possible in the absence of ovarian tissue; that when a woman continues to menstruate at regular intervals after complete double ovariectomy, it must be assumed that she is still the carrier of ovarian tissue.

The argument of Dr. Gellhorn for the "habit of menstruating" aided by the added blood supply coming through the omental tissue adhered to the uterus, is well taken in his case but cannot be accepted without qualification without excluding the possible existence of accessory ovarian bits; and this, I believe, to be a physical impossibility in the living subject.

That the ovaries are not the only essential etiological factor in menstruation we can neither affirm nor deny. The case of Gellhorn and the experiments of Halban, suggest the possibility that menstruation can proceed and can recur at regular epochs over periods of months and years after the removal of all ovarian tissue. There is much need for further investigation of this important subject.

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## ECLAMPSIA COMPLICATING DELIVERY OF MON-STROSITY (CEPHALOTHORACOPAGUS-MONOSYMMETROS).\*

BY

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AND

ISADOR SEFF, M. D.,

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(With two illustrations and plate.)

THIS case is worthy of report not only because it is a comparatively rare monstrosity, but also because of the interesting clinical feature it presents.

A. H. K., age twenty-seven; married two years; had never been pregnant. Began to menstruate at fourteen years, was always irregular, from four to ten weeks; flow of about five days' dura-

\*From the First Gynecological Service and the Pathological Department of Beth Israel Hospital.



tion, scanty, with marked dysmenorrhea. Sought advice because of the dysmenorrhea and irregular menstrual periods.

General condition good. Development and nourishment good. Physical examination negative. Urine negative. Bimanual examination showed uterus somewhat small and anteverted, and both ovaries and tubes adherent. Admitted to my service at Beth Israel Hospital, on August 29, 1909.

*Operation.*—Left ovary enlarged and cystic, and fimbriated extremity closed: portion of ovary resected and fimbria of tube opened. Adhesions about right ovary and tube were broken up, and oophorectomy operation performed on fimbriated extremity of tube. Appendix showed chronic inflammation with adhesions; removed in usual manner.

Discharged September 12, 1909.

The patient, who lived in Florida, returned to this City in May, 1911, being gravid in the third month. She had menstruated last on February 2; the expected delivery was therefore about November 10. She was under observation by her brother, a physician, and her pregnancy up to September 18 was normal and uncomplicated except that the size of the abdomen suggested twins. Her urine was examined chemically and microscopically at frequent intervals, and was negative on every examination.

On September 18, at about 4 A. M., without any premonitory sign, the membranes ruptured, and a large quantity of amniotic fluid escaped. There were no labor pains. The patient was transferred to a private sanitarium. I saw her at about 10 A. M., when the pains first appeared. Examination then revealed the os dilated to the size of a half dollar, head presenting. Palpation of abdomen strongly suggested twin pregnancy. The patient made satisfactory progress for the next hour or so, when she began to complain of dimness of vision. A specimen of her urine taken at that time was sent to Dr. J. J. Hertz for examination, who reported it negative as to albumin, sugar, and acetone, and with only a very few cylindroids.

Rapid delivery was now decided on. Ether was administered, and after manual dilatation of the cervix, which was readily effected, high forceps were applied, and the monstrosity described below extracted. The placenta was expressed. Shortly after delivery (about 2 P. M.) patient had several convulsive attacks, but under stimulation with strychnine and nitroglycerin the convulsions ceased, and the pulse, respiration, and sight improved. At 6 P. M. 36 ounces of urine were withdrawn by catheter. At about 8 P. M. the patient was again seized with convulsions, and in spite of nitroglycerin, venesection, etc., failed to rally, and died at 12 o'clock that night.

In addition to the fact of pregnancy occurring after plastic surgery on the adnexa, this case presents the interesting question as to whether or not the previous operations on the tubes and

ovaries had any bearing on the abnormal development of the fetus, and whether the latter was a causative factor in the eclampsia, especially as the patient failed to show any affection of the kidneys, or any other organ, previously.

The fetus was dissected by Dr. Isador Seff, with the assistance of Dr. Eli Moshcowitz, Pathologist to Beth Israel Hospital.

Specimen of cephalothoracopagus-monosymmetros, consisting of one head and two trunks. The trunks are joined on their thoracic aspects from the neck to the umbilicus. There is no sulcus either anteriorly or posteriorly. The posterior shoulders are slightly higher than the anterior. The head is attached directly to the trunk without any apparent neck. The upper and lower extremities, external genitals and the part of the trunk below the umbilicus show no abnormality.

Length of specimen, from crown of head to soles of feet, 33 cm.

Width, middorsal region, side to side, 8 cm., front to back, 6 cm.

Length from neck to umbilicus, 6  $1/2$  cm.

Measurements of head, frontooccipital, 8  $1/2$  cm.; bitemporal, 7 cm.; occipitomenta, 9  $1/2$  cm.; bimastoid, 7 cm.

*Head.*—From the anterior aspect the face reveals nothing abnormal. Both ears prominent. On right ear a small polyp at the upper junction of helix to head. The antehelix is prominent on both sides. Eyes show nothing abnormal. Nose flat. Chin joins directly to neck. The occipital portion of the head is unusually wide. In the median line posteriorly at the junction of the head and neck is apparently a double ear. This structure is heart shaped and manifestly formed by two ears joining in the median line. The antehelices are united.

*Cranial Cavity.*—The brain was so macerated that it could not be studied.

The cranial vault is made up of seven bones: two frontals of normal conformation; two parietals; and one occipital, of normal conformation. Between the parietals and the occipital bones are two small bones, triangular in shape, and about size of a dollar, the borders of which are the base of the skull, anteriorly are the parietal bones, posteriorly the occipital bones.

On opening the cranial vault, the anterior and middle fossa present a normal appearance. The posterior fossa, however, presents many abnormalities. It consists of two lateral halves, each half being bounded by the petrous portion in front, laterally, by the accessory bones described above, posteriorly, by a small portion of the occipital bone, and toward the median

line by a large pyramidal shaped bone, which has the appearance of another petrous bone. In the anterior part of each cavity, and situated toward the median line is a large opening, the foramen magnum. The accessory petrous bones are separated in the median line by a distinct deep groove.



FIG. 1.—Cephalothoracophagus monosymmetros.

All the cranial nerves appear to be in their normal situations. In addition there appear to be two cranial nerves making their exit through the accessory petrosal bones. One lies just below

the superior ridge of the above bone in the median line, the other just below it.

The sella turcica of the sphenoid bone is shallow.

The accessory petrosal bones are attached directly to the



FIG. 2.—Radiograph of cephalothoracophagus monosymmetros.

posterior wall of the infundibular fossa. There is a broad deep transverse groove between these bones and the pituitary fossa.

On the superior ridge of the accessory petrosal bones, at the junction of the middle and posterior third are a pair of large foramina, the diameter of a goose-quill. The openings face almost directly anteriorly, and are surrounded by a distinct



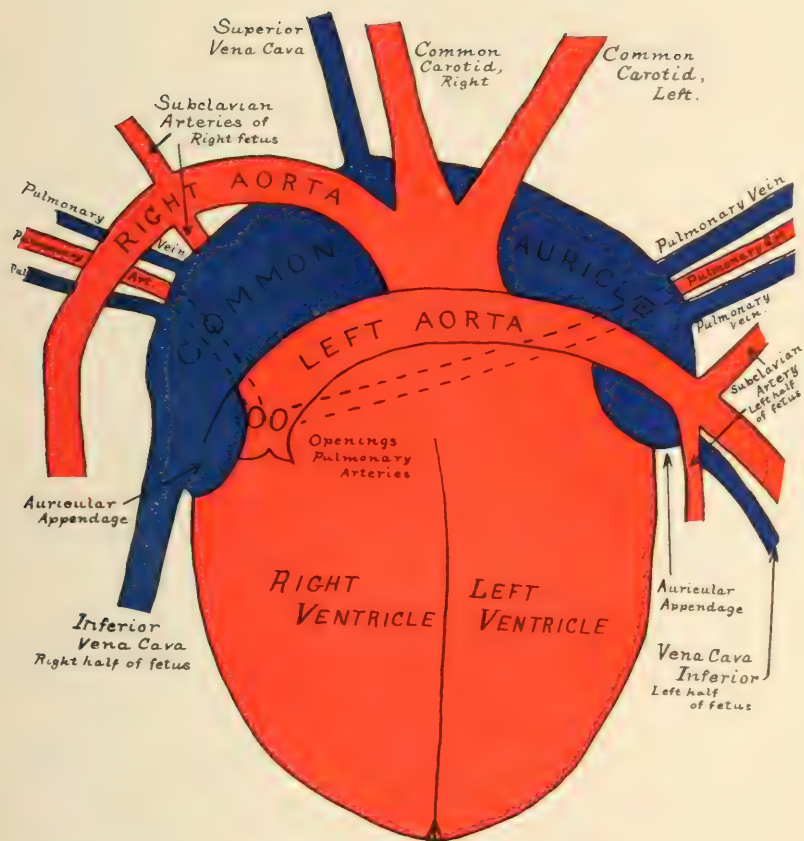


DIAGRAM OF HEART OF CEPHALOTHORACOPHAGUS MONOSYMMETROS.—LADINSKI.





CEPHALOTHORACOPAGUS-MONOSYMMETROS.—LADINSKI.  
Anterior and Posterior Views





elevated ridge. These foramina are pierced by a large plug of connective tissue rising from the dura.

Through the accessory double ear, the probe passes into a canal, which leads directly forward in the median line for a distance of 5 cm.

*Umbilical Cord* is large, flattened, contains two distinct sets of vessels, one for each body.

The sternum is entirely absent anteriorly. The space between the ribs of the joined fetuses is occupied by six short ribs which bridge the space where the sternum is normally situated. These ribs are curved with the concavity upward, the lowermost ribs showing a greater curve than the upper. The upper ribs are slightly shorter than the lower. These ribs articulate with the main ribs on either side.

*Mouth.*—The posterior half of the hard palate, and the soft palate are not united and form an arch opening posteriorly, exposing the nasal cavity and the base of the sphenoid superiorly.

There is a single broad tongue, attached to the posterior wall of the nasopharynx by a ridge-like fleshy process, which divides the pharynx into two lateral fossæ. A probe passed into either fossa downward and inward leads into the esophagus. The upper portion of the esophagus is therefore a triangular pouch, the main bulk of the pouch being situated just behind the larynx. There is no apparent opening into the larynx. No tonsillar structure can be made out.

The larynx is situated at the base of the tongue and is separated from it by a cartilaginous structure, which is manifestly the epiglottis. The epiglottis covers the superior opening of the larynx, completely shutting it off from the mouth. The larynx is broad and contains the normal vocal cords. The larynx is closed off at its superior opening by a fibrous membrane, which separates it from the epiglottis. There is one trachea.

The thyroid glands are two in number, each about the size of a bean, and situated on either side of the larynx at its junction with the trachea. The thymus gland is normal.

*Lungs.*—Right lung consists of three lobes. The upper lobe is small. The lower larger part of the lung is made up of two lobes separated by a longitudinal fissure, which extends half way up the posterior aspect.

The left lung is irregular in shape, and consists of three lobes, formed by two fissures which extend from the anterior margin

upward and posteriorly to a distance a little more than half the anteroposterior diameter of the lung.

*Heart* appears rather broad, apex situated downward and to the right. The anterior fissure divides the anterior aspect of the heart into two equal parts. Above and to the right, a small portion of the auricle is visible, above and to the left another portion of the auricle is visible.

On opening the auricle, it is found to be one large cavity having no septum.

On opening the ventricles we find the septum extends upward for two-thirds the length of the cavity, and the upper part of the ventricle is a large common cavity.

*Circulation.*—(See diagram.) The superior vena cava empties into the auricle at its normal site, and there is only one inferior vena cava coming up from right half of fetus and entering into the auricle at the normal site. The left inferior vena cava comes from the left fetus, and enters the auricle posteriorly and directly opposite to the inferior vena cava of the right side.

Coming from the right ventricle is the aorta from the left fetus, which just above the semilunar valves gives off the pulmonary arteries, and then continues as the arch of the aorta and gives off the subclavians to the left upper extremities. Coming from the left ventricle from a common atrium is the aorta of the right fetus, which gives off in its course the common carotids for the head, and the subclavians for the right upper extremities.

*Stomach* is a pouch shaped like a Maltese cross. The upper arm of cross is very short, leading into the esophagus. The lower arm contains a thickening, apparently the pylorus, and leads into the small intestine. The lateral arms of the cross are two pouches, each about the size of a bean. The whole stomach holds about a dram.

In the upper portion of the small intestine, corresponding to the first part of the duodenum, we find only one distinct papilla of Vater.

From the pylorus there extends a portion of the small intestine which is 87 cm. long, and at this point it divides into two parts each 67 cm. long. At the terminal end of each of these portions the cecum, appendix and large intestine for each half of the fetus arise. These portions of the intestine are normal in situation, and shape, measure each 32 cm. in length, and proceed in orderly manner to the sigmoid flexure and rectum. Both anuses are patent.

*Livers.*—There are two distinct organs. One larger, is situated on right side, and extends partly over median line. It corresponds in shape to the normal liver. The convex surface is indented by numerous large fissures, which extend upward obliquely from inferior aspect, dividing this surface into three or four smaller lobes. The ductus venosus penetrates the anterior aspect of the liver through a rather deep fossa. At the transverse fissure the portal vessels enter the liver in a normal manner. The inferior vena cava of the right side enters the liver at its normal situation. This liver has a distinct well-formed gall-bladder on its inferior aspect. Owing to postmortem decomposition the exit of the ducts could not be ascertained with accuracy.

The second liver is about one-third the size of its fellow, and is situated posteriorly in the median line. It has two surfaces, anterior flat, posterior deeply convex, and fits accurately into the concave posterior abdominal wall. This liver is penetrated on its anterior aspect near the upper border by the blood-vessels, which appear to correspond to the portal vessels of the left side. The smaller liver has no inferior vena cava. The portal vessels of the two livers communicate by a narrow bridge which crosses in front of the upper portion of the small intestine.

There are two *spleens*, the one on the left side, situated in its normal site, normal in shape, size and dimensions. The spleen of the right side is situated at the upper and right corner of the posterior abdominal wall, just over the left kidney of the right half of fetus. Its pedicle is connected with the right portal system. The pedicle of the left spleen is connected with the portal system of the left liver.

There are two *pancreases*. One lies between liver and spleen of left fetus, and the other between liver and spleen of right.

The kidneys, adrenals, and genitourinary systems are double and situated in their normal positions. There is a uterus with normal appendages for each fetus.

Posteriorly the two sides of ribs articulate the same as anteriorly. There are two distinct spinal columns.

SOME SEVENTEENTH CENTURY OBSTETRICIANS AND  
THEIR BOOKS.

BY

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(With eleven illustrations.)

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## I.

A MODERN imagination pictures to itself -but with difficulty the status of the obstetrical art of the seventeenth century.



Fancy a world into which Leeuwenhoeck (1632-1723) had not yet brought the revelations of the microscope; where Harvey had but just made the discovery (1628) of the circulation; in which the obstetrician had never heard of Laennec and his stethoscope (1819), or of those fetal heart sounds which that instrument alone has drawn within the compass of his ear; in which the secret of the obstetrical forceps still belongs exclusively to four generations of Chamberlens; with Simpson (1847) and Semmelweis and Lister still more than two centuries away. Imagine a lying-in chamber which the physician enters either not at all, or heavily veiled and often at the peril of his life; in which the Cesarean operation is only undertaken on the dying or dead mother, and where parturient women perish undelivered after labors lasting from three to ten days.

The picture of such a period can be compared but to that of a physical universe just emerging from a glacial epoch, with only a few peaks yet uncovered and all the rich scientific landscape and pasturage, so familiar to modern eyes, still buried amidst the mass of conjectural ignorance and superstition which then passed for knowledge.

If those old fathers and mothers of obstetrics, to whose writings this essay is an insufficient tribute, are to be judged by modern standards of science or language or thought they are by turns funny and pathetic, archaic, priest-ridden, futile and dogmatic; yet if we think of them as real men and women fighting their way to real knowledge with insufficient weapons and through an uncertain light, we find them often measuring well up to our best present day standards either professional or humanistic. We have but to remember that the correct thinker survives his age by virtue of a mind instinctively accepting fundamental truth and discarding error; this correctness of vision is, at bottom, a matter of personal and habitual independence of mental process and of correct development of the logical faculty; individuals thus fortunately equipped engage in original thought despite all handicaps, and furnish to each age its fund of imperishable ideas. In the ancient world Hippocrates and Aristotle were such original thinkers. Galen and Pliny were ephemerals whose mental processes followed conventional lines—a pair of gullible old women whose ingenious romanticism is only equalled by the quality of the fables which they themselves believed. Of those writers whom we shall presently consider, Mauriceau, the Chamberlen, Justine Siegemundin and Cornelius Solingen

were original thinkers and thought with Aristotle; Scipio Mercurio, Jane Sharp and Elizabeth Nihell—yes, and perhaps Louise Bourgeois—were, like Galen and Pliny, mere gleaners in the scientific field, picking up grain and chaff alike without much thought of the actual value of their gatherings.

It is no new idea that with the discovery of the art of printing the night of the dark ages melted away almost within a generation. Yet it is interesting to notice anew in these old books the avidity with which the human mind reaches out for knowledge when effort is all that is necessary to bring knowledge within reach. To learn, to compare, to judge of error, are normal functions, and normally in operation when the individual is unhampered by fear or tradition, or by prejudice under the cloak of religion. With knowledge once available to the ordinary man through type, restrictions of geography and language become inadequate to hold back his effort to acquire it, and he uses it, later on, as material with which to enrich his own thought and that of his friend and pupil. He travels, brings back foreign books, translates and prints them, and science becomes for the first time since the tower of Babel a universal brotherhood which knows no race or strange tongue. Not only is this true, but each generation instead of starting *ab initio* to think out its own science with what little assistance tradition and manuscript can give it, is now enabled to stand on the shoulders of its ancestors while reaching a little farther into the firmament of knowledge.

Most of the old books on which this essay is founded were immediately translated into other languages. They furnish still lively examples of the eagerness with which the hungry and just awakened medieval world took advantage of the discovery of the art of printing to burst asunder the barriers which religion and language and geography and the span of human life, and the hitherto imperfect media of thought-transmission had raised to curb the appetite for knowledge.

Gottfried Welsch, Doctor of Medicine and Philosophy, and Professor and Assessor of the Medical Faculty of the University of Leipsic, translated into "Hochdeutsch" the Italian *Commare del Scipione Mercurio on Obstetrics*, the French tractate\* of Severinus Pinaeus on Embryology, the French treatises and memoirs of Louise Bourgeois, and published them with his own

\* The old word; the word *essay* originated with Francis Bacon.

commentaries, in 1652, in one enormous "Hebammenbuch" of nearly 2000 octavo pages.

The German Chur-Brandenburgische Hoff-Wehe-Mutter of Justine Siegemundin, dated Berlin 1690, was immediately translated—as it deserved to be—into Dutch by Cornelius Solingen, as well as into several other languages.

The Dutch *Hand Griffie der Wundartznei, nebst Embryulcia, und dem Ampt und Pflicht des Wehemutter's*, by Doctor Cornelius Solingen, of the Haag, was translated in 1712 into German, by an anonymous "Wohlhaber der Wundartznei," and published by Gottfried Zimmermann of Wittenburg.

The French "Diseases of Women with Child, and in Childbed," by Francis Mauriceau, was translated into English in 1672 by no less an obstetrician than Hugh Chamberlen. This great work was also translated into German during the same decade.

Sommern in 1676 translated into German a Swedish tractate on Scurvy.

The English treatise on the Art of Midwifery by Elizabeth Nihill (1760) received not only its primary inspiration from a French book, but when rendered from English back into French, was eagerly read by French midwives.

The writings of Louise Bourgeois were rendered into English quite as early as into German. Included in the only edition (third, 1663) of "The Compleat Midwife's Practice" to be found in the library of the British Museum, "with Cutts in Brass," is an anonymous translation of the "Instructions to her Daughter."

These are but a few instances of the early use which men made of the printing press to convert one branch of the art of medicine from a series of narrow systems of local traditions and experiences into a genuine science of universal application.

Although Ambroise Paré (1562) something over a century after the discovery of printing published the volume which served as the germinal spot for all modern obstetrical books, it was only after another half century that modern obstetrics really found its voice. And what curious uncertain voices come to us from those early printed pages! Not at all like the guarded utterances of our modern frock-coated professors, whose sentences march in solemn impersonality across an annotated page. These old fellows have no formal style, no dignity, small respect for the truth, and their thoughts come tumbling out with as little regard for sequence as have the types on the same pages for alignment or uniformity. They never hesitate to smite each

other vigorously and viciously, tell the intimate obstetrical history of their own families unblushingly, give us their patients' names and street addresses, and fill their pages with a heterogeneous mass of rubbish, superstition, tradition, speculation and error, that should have perished in the telling without being indiscreetly perpetuated in black letter by the *furor scribendus* of the seventeenth century. And such error dies hard, even when put into cold type. To be sure, in one sense the surest way to kill an error is to print it, for the act of printing presupposes publicity, and a multiplicity of intelligent critics will kill error sooner or later every time. But in another more literal sense the error and its record die only with the printed page, and once there the Index Expurgatorius but excites our curiosity, and the public *auto da fe* only makes us long for copies which may have escaped the flames which consumed the balance of the edition.

But, after all, the best record of progress is comparison, and today we have to thank these old books and their writers more for their record of error than of truth; for the truth we know, the error we might have forgotten but for the record. And how else, then, could we congratulate ourselves on the abysses of ignorance and superstition from which we have only just escaped? Yet future generations—sad after-thought—may presently be saying the same things of us, and thanking some of us, who shall be nameless, for thinking in good loud type, not wisely, but too well.

## II.

Although these fragmentary memoranda have introduced themselves to the world as an obstetrical essay it would hardly be human, in the presence of this group of very curious and distinguished old books, to refrain from some sort of commentary on their physical attributes, irrespective of the thought carried by their pages. What of their paper, binding, print, of the language in which their thought is set forth? One might write a volume in itself in answer to each of these questions, and each chapter would be a "tractate" on the status of bookbinding, printing, and language in the seventeenth and eighteenth centuries.

*Paper.*—The age of parchment and vellum—except for bindings—has passed on; the printed page is a paper one, but the paper is uncalendered, of rough fiber, yellow or brown, poorly bleached, of varying thickness, and not yet either water-marked



or lined with the mesh of the cloth or wire between layers of which the modern paper-maker squeezes out his pulp. In one of these old books (1693) I found a transitional word which tells the story of the paper, *papeyr*, the ancestral word for *papier* and



FIG. 1.—Gottfried Welsch's translation of Scipio Mercurio, 1652.

*paper*; and in that word and the coarse mixed *papeyr* upon which it was printed my mind's eye saw, not so very far away, the Nile and its waving balrushes and an old Egyptian writing on a leaf of papyrus.\*

\*The ancestry of modern paper, by the way, does not follow the etymology; our paper goes back to the *pulp* process of India and China.

*Binding and Bookmaking.*—The earlier books of this group, in German, are bound in thick parchment or pigskin; the later ones, in French and English, in leather. The volumes are not of standard sizes like the modern quartos or octavos, for the

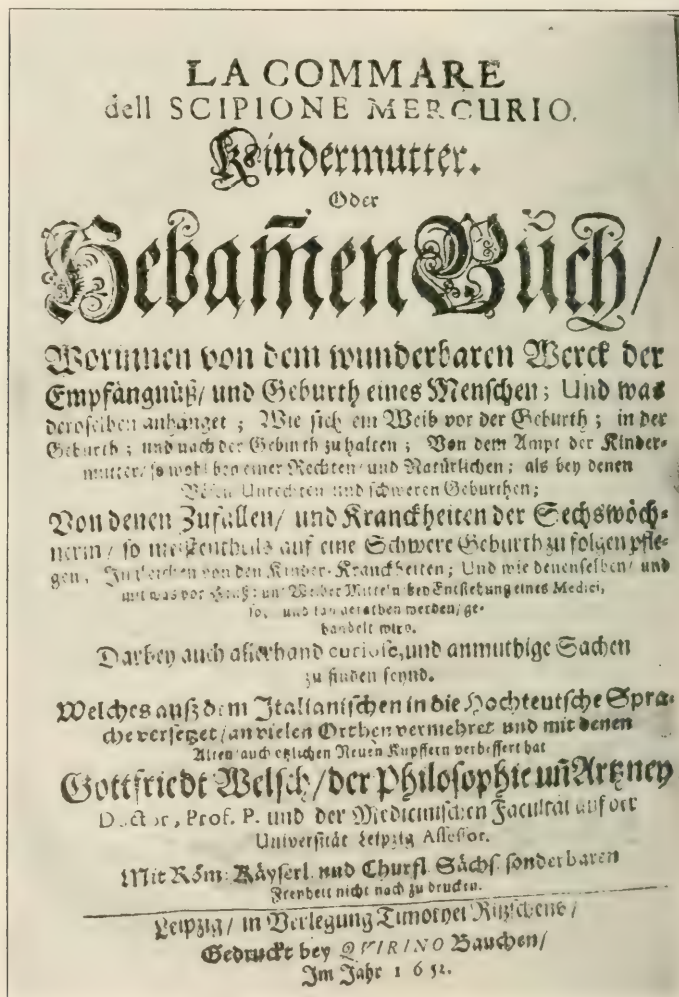


FIG. 2. Second title page of Gottfried Welsch.

bookmaker cut his pages to suit his own fancy and sometimes even changed his gauge in the middle of a book. The books are often nearly as thick as they are deep. The binder's art has not gone far enough in the early half of the seventeenth century to

print or stamp or tool the bindings. For example, the volume collected and annotated by Gottfried Welsch is a clumsy, thick, irregular octavo bound in heavy pigskin, back gone, and sides cut into by a vandal's knife, the cover still showing some traces



FIG. 3.—First page from Justine Siegemundin's *Hoff-Wehe-Mutter*.

of colored *hand* illumination and text. Under the warped and incised pigskin can be seen the pasted sheets of waste printed paper out of which the old bookbinder made his pasteboard. The book was issued in parts, each with a different date and



Die Chur-Brandenburgische  
**Hoff-Wehe-Mutter** /  
 Das ist:  
 Ein höchst-nöthiger  
**Unterricht** /  
 Von schweren und unrecht-stehenden  
**Geburten** /  
 In einem Gespräch vorgestellt,  
 Wie nemlich / durch Göttlichen Verstand eine  
 wohl-unterrichtete und gelehrte  
**Wehe-Mutter** /  
 Mit Verstand und geschickter Hand / dergleichen verhüten/  
 oder wanns Noth ist das Kind wenden könne  
 Durch vieler Jahre Übung selbst erfahren und wahr befunden/  
 Nun aber /  
 Gott zu Ehren und dem Nächsten zu Nutz /  
 Auch / auf Gnädigst- und inständiges Verlangen / Durch  
 laudtigit- und vieler hohen Standes-Personen  
 Nebst Vorrede / Kupfer-Bildern / und nöthigem Register  
 auf eigene Unkosten zum Druck befördert /  
 Von  
 Justinen Siegemundin / geborne Ditttrichin /  
 von Nennstet aus Schlesien im Jaurischen Jarzehnt gelegen.  
 Mit Röm. Käyserl. Mayr. auch Chur-Sächs. und Chur-  
 Brandenburgischen Special-Patent.  
 Cölln an der Spree /  
 Gedruckt bey Ulrich Keyperen Churf. Brandeb. Verleger.



imprint, and each with an elaborately engraved and symbolic title page.\*

Cornelius Solingen—translated into German by an anonymous Liebhaber der Wund-Artzney, second edition, Wittenberg, bey Gottfried Zimmermann, 1712; 7×9×2.5 inches—is bound in thick parchment, folded in at the corners, that rattles when the book is opened; the title is written on the back in script. A wonderfully engraved frontispiece gives us a bird's-eye view of God, Adam and Eve, a serpent swallowing his tail, a landscape with fuzzy trees like wigs, and a set of surgical instruments spread out on a lawn. At the back of the book are numerous plates showing surgical instruments massive and indestructible enough to have lasted till the present day.

Justine Siegemundin's must have been a beautiful book in its prime, Berlin, 1690, if the present binding was the one in which it was originally published. Probably it was, for Justine was proud of her book, and at her own expense had the "Kupffers" which illustrate it so elegantly, cut or etched in Holland, at the Haag, by Regnerus de Graaff. The first page is a beautifully engraved plate showing a garland of four children and a medallion head encircling a motto:

"An Gottes hilff und Segen  
Beschickten Hand bewegen  
Ist all mein Kuhn gelegen."

The medical and theological soundness of the matter, communicated in a lively dialogue by Justina to Christina, is attested by certificates from the medical faculty of the University of Frankfurt an der Oder, and from the official preachers of the court of Berlin. The book is about 7 inches by 10 inches by 1.5 inches, printed in exquisitely clear Gothic blackletter of varying size, on fine nearly white paper showing the wire mark but without water-mark, with faded gilt edges, and bound in soft-grained brown calf leather with a tooled border terminating in each corner with the puffy gold and velvet crown of the Churfürsts of Brandenburg. The esteem in which Siegemundin was held by her generation is shown by the fact that her book was translated into Dutch by Cornelius Solingen.

Here is a thin unbound large octavo brown paper pamphlet published in two parts at Meiningen in 1682, containing in Part I

\* For reproduction of several of these title pages see the writer's article on Louise Bourgeois, *AMER. JOUR. OBST.*, May, 1912.

"Nothwendig und nützlichen Hebammen Unterrichten des Herrn Bernhard's Landen." In Part II are certain "Geistlichen Unterrichten"—prayers, psalms, meditations, proverbs, and forms of baptism to be used by midwives. A very beautiful example of clear, large, Gothic blackletter printing, with marginal headings and fancy initials. This old pamphlet is of great interest in its disclosure of the contemporary attitude of the community toward the midwife. She is admonished as to her conduct toward the state, toward patients, "medicos" and rivals, toward unmarried patients; to be found always at home; to keep her mouth

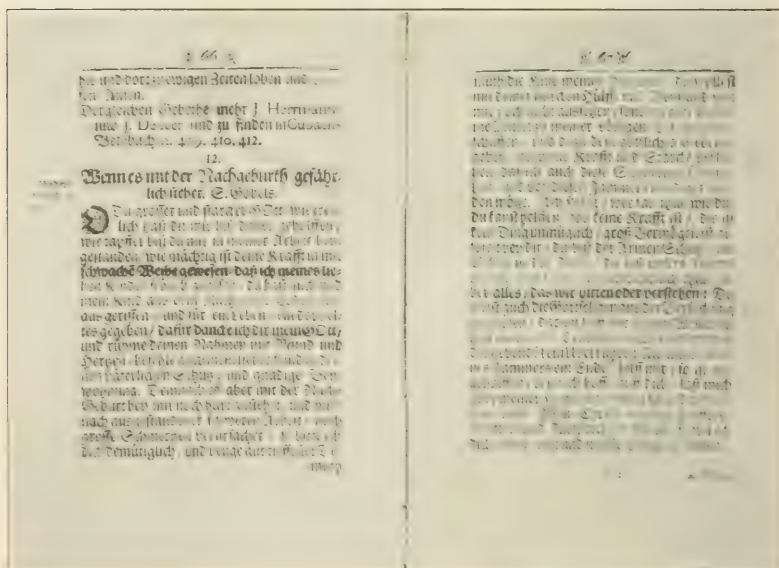


FIG. 5.—One of the "Geistlichen Unterrichtu" from "Nothwendig und Nüttz Eichen Unterrichts Leo Herrn Bernhard's Lauden." Meiningen, 1682. A prayer for a troublesome placenta.

shut; to take only what her patients can afford to pay; to abstain from "Vollsaufen und Hurerei"; to keep herself clean and her finger nails cut short; to engage in daily prayer of a prescribed form; and to have in readiness a goodly number of prayers for the various obstetric emergencies. These prayers, some in rhyme, are printed in full, together with many appropriate texts, psalms, etc. A separate prayer is offered for each emergency—such as delayed labor, twins, one twin dead, malformation, malpositions,

cord prolapsed, arm prolapsed, retained placenta,\* etc., as well as a prayer of thanks for a happy delivery. The pamphlet reveals the deeply religious spirit with which the life of the German community was at that time saturated. The style of the anonymous writer is direct, simple and forceful, and the pamphlet must have exerted a strongly elevating influence over the midwives for whose instruction it was prepared.

Contrast this with the *Hebammenbuch* by Johann Georges Semmern, of Arnstadt in Schwartzburg, published Jehna, 1676, bound in tough pigskin and, though hardly 3 inches by 5 inches, containing over 500 pages of thick brown paper, bearing the imprint of a rough irregular old German type in atrocious ink. This clumsy little book has probably kept its original shape and condition because very few dead "*Hebammen*" ever cared to risk their eyesight trying to read it. Quite as much may be said of the typography of several parts of Gottfried Welsch.

And this brings us to another point of interest. Many of these old books are made up of several parts printed at different times and by different printers. For example, the *Sommern* contains *Hebammen Unterrichten*, 1676; *Christlichen Kinder Zucht*, 1676; *Weiber und Kinder Pfleg-Büchlein*, 1676; and *Bericht von Scharbock*,† from the Swedish, 1675. The type of these different tractates is so unlike that we must conclude they were printed at different offices from separate fonts and brought together only for binding.

The best examples of varying excellence of typography is to be found between the covers of the massive volume of Gottfried Welsch (title page dated 1651). Here we find German translations of the three parts of *La Commare del Scipione Mercutio*,‡ printed in execrable type by Tim. Kitzschen at

\*See halftone reproduction of two pages.

† *Scurvy*, see post.

‡ Published in Italian in Verona in 1600 by Girolamo Mercurio. Girolamo Mercurio, called Scipio, was born in Rome in 1550 and died—somewhere in Italy—in 1615; he was therefore almost a contemporary of Pare, although he does not seem to have been familiar with his teachings. He studied in Bologna and Padua, and at Milan took the habit of the Dominicans. Theology shaded off imperceptibly into medicine in those days, and in order to practice medicine without interference he took a not unnecessary course in dogma at Padua. Like most Italian professional men and craftsmen of the period, he was a great wanderer and found his way to France and Germany in 1571, attaching himself under the name of Scipio to the company of mercenaries under Jerome de Lodrone. At that time he relinquished his order but, unlike his roving countryman of the same period, Benvenuto Cellini (1500-1571), his life was irreproachable. Returning to Italy in 1572 he became widely known as a physician and enjoyed the friendship

Leipzig in 1652. Following this are three parts of the works of Louisa Bourgeois,\* printed in handsome small blackletter during different years (1629 to 1644), by Philip Fievet and Erasmus Kempffern for Matt. Merians in Hanau and Franckfort-am-Mayn. Then comes a tractate on Embryology by Severinus Pinaeus, body surgeon to the King of France, in clear heavy black letters, with well drawn "coppers" executed by J. T. de Bry. This translation was printed by Fievet for Marian at Franckfort in 1648. Then two more translations from Louisa Bourgeois—the *Schutzrede* (1629) and the *Secrets* (1644), very indifferently printed for and published by Merian, which end the volume. Several of the many title pages bound with this book are beautifully engraved, but many of the Italian illustrations, which Welsch tells us he has "*Wohlbedachtig geendert, um das was argerliche Augen argern mochte verdecken lassen,*" have been unfortunately abstracted. The reader may not be unnecessarily reminded that the various writings gathered into this book received their original publication during a period covering almost exactly that of the Thirty Years' War (1618–1648), and that the work was finally completed and issued almost coincidentally with the treaty of Westphalia.

Here are four curious old books from French and English presses.

"Diseases of Women with Child, and in Childbed, as also the best Means of helping them in Natural and Unnatural Labors;

of the pope and the nobility, living much of the time in Peschiera. In 1600 he resumed the Dominican habit. His knowledge of the classics was remarkable and he must have had access to vast libraries of ancient manuscripts, for his works are an inlay of quotations from older writings. His apology for writing his *Commare* in the Italian mother tongue instead of in Latin was that the midwives and gentry, for whom it was intended, could not read the latter language. Portal (*History of Anatomy*, II, 258) does him the injustice to describe his works as those of a charlatan, but his knowledge was quite abreast of the times, for the times were theological, classical, legendary, and altogether destitute of any true scientific spirit. His books were well illustrated, and the esteem in which he was held is shown by the fact that his *Commare*, which was published in Verona in 1600, was republished in Venice in 1601 and six times more in Italy before 1676, and was translated twice into German. His book is a curious mixture of current gossip, mysticism, superstition, and glimpses of real truth, for all but the last of which his ecclesiastical training and the *zeitgeist* are of course responsible. He says nothing original, rambles off into theology on small provocation and has a dogma or a quotation to meet every emergency. As a compiler he gives an invaluable picture of the obstetrical traditions of his own and preceding periods. He is the obstetrical Pliny of the middle ages, but to Pliny's insatiable appetite for legend he adds a capacity for theological obstetrics altogether his own. His explanation of the method by which impregnation may occur through the Evil One, even though that very active individual is conceded to lack corporeal attributes, is a triumph of constructive demonology.

\* See halftones of title page and portrait in this magazine for May, 1912.





Comments by Chamberlen, explanatory, exclamatory, derogatory, or sharply contradictory, are inserted in italics in the lateral margins. Some scientific gentleman has abstracted

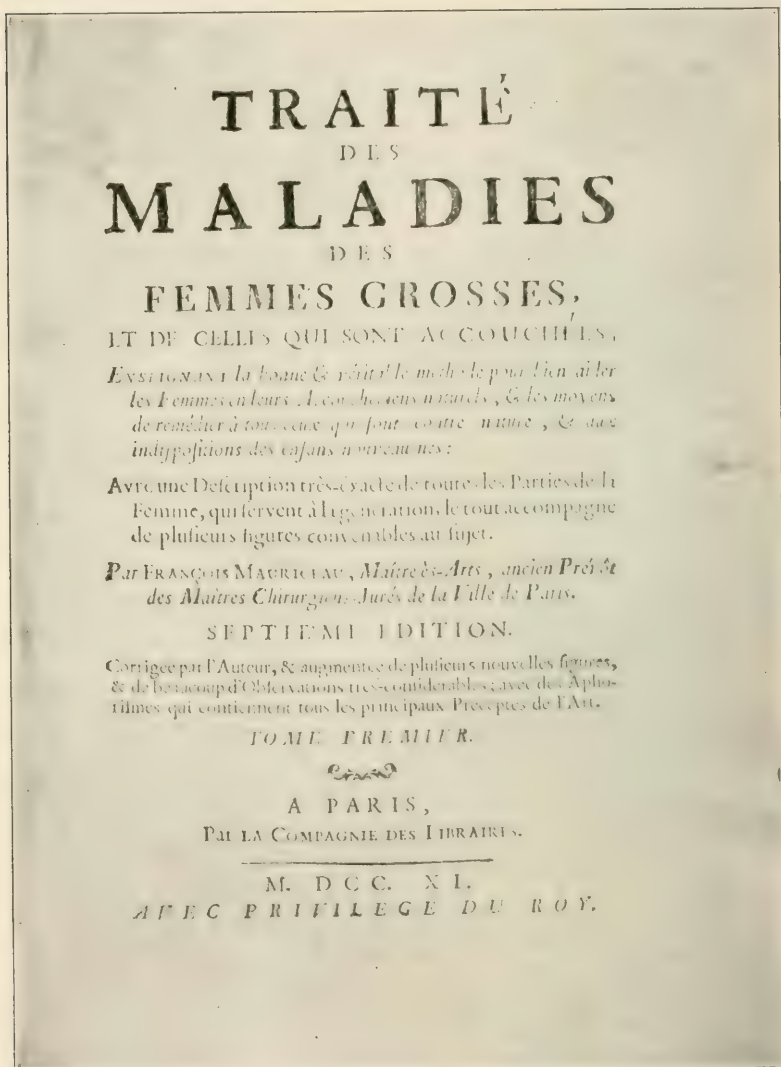


FIG. 7.—The seventh (1740) French edition of Mauriceau.

most of the plates with which the copy examined by the writer was once enriched. There remain several good "coppers" illustrating a murderous looking "extractor" which was to be

screwed into the infant's head. This was the celebrated *tire-tête*, invented by Mauriceau, and Chamberlen must have laughed in his sleeve when he reproduced the illustration for his English public. The less said about this aspect of the Chamberlen family, the better; for there must have been something morally wrong with obstetricians who would deliberately countenance the use by others of an infanticidal instrument like the *tire-tête*,

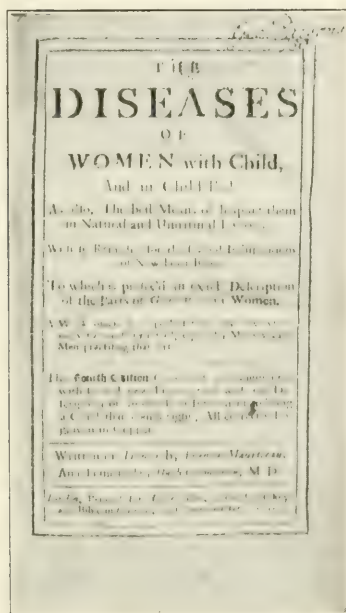


FIG. 8.—The fourth English (1716) edition of Mauriceau.

while themselves employing secretly an instrument which they knew was capable of saving a large proportion of infant lives. In his translator's preface Hugh Chamberlen apologizes for not publishing to the world the secret of his own instrument (the forceps), on the ground that the secret was not his own but his family's, of which several members were still living.

A more ancient book, both in appearance, language and subject matter, is that of Jane Sharp.

"The Compleat Midwife's Companion, or the Art of Midwifery improved. Directing Childbearing Women how to order themselves in their conception, breeding, bearing, and nursing of children. In six books and several chapters, with physical

prescriptions for each disease incidental to the female sex, whether virgins, wives, or widows." First edition London 1671, 8vo with plates. Many editions, of which this copy is a fourth, printed in 1725 without plates, but with a curious old frontispiece. The old binding has evidently been replaced by cloth boards during the last hundred years. The book is a small twelvemo; the paper is poor; the alignment is bad; the type and ink are worse; the pages are irregular and poorly cut. The

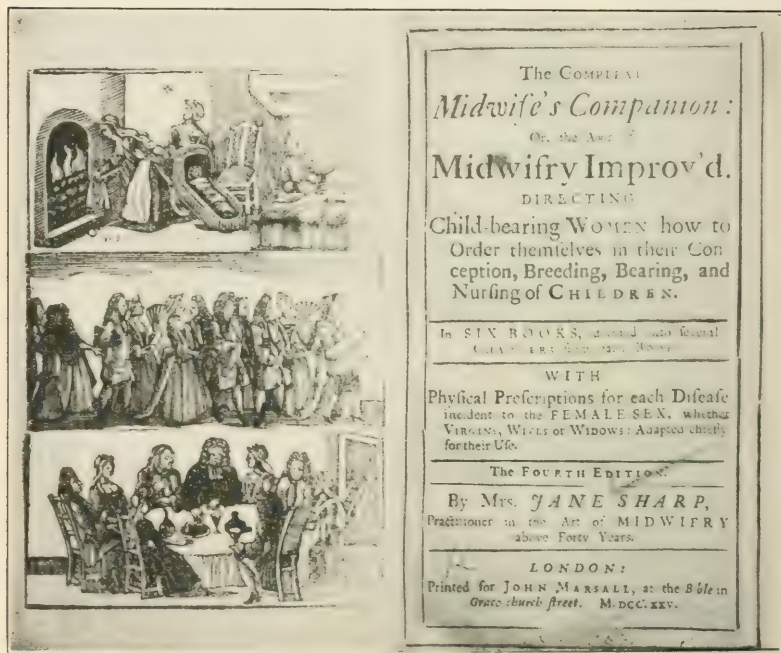


FIG. 9.—Frontispiece and title page; Jane Sharp.

volume was evidently not meant for scholars or those accustomed to fine and expensive editions; in fact it must have been what its title announces—a book written by a midwife and intended to supply her uncultured sisterhood with a fund of useful knowledge, expressed in every-day vernacular, not available at that time in any other form. The writer states that she “has been at large expense translating books from French, Dutch, and Italian.” Most of the names are capitalized, although this custom is but irregularly adhered to. The book contains neither Latin nor references, but is a wonderfully interesting mine not only of





FIG. 10.—Justine Siegemundin—gel. Dittrichin. from Delacoux' *Sage femmes Célèbres*.

archaic nomenclature and phraseology but of the obstetrical customs and traditions of the common English people of the seventeenth century. To these features we will return later on.

And who, by the way, was this Jane Sharp—"Mrs. Jane Sharp, for forty years practitioner of midwifery," as the title page \* of her book tells us? And who wrote her book, if she



FIG. 11.—Mrs. Elizabeth Nihell. From Delacoux' *Sage femmes Célèbres*.

didn't write it? To these questions we are constrained to answer after a faithful but fruitless search through libraries and encyclopedias—*dass weiss Gott allein?* Justine Siegemundin we know and love; Elizabeth Nihell we have encountered and cannot forget—and here are their faces to vouch for them.\* But as for Jane Sharp, the library of the British Museum knows her not, except as the authoress of the above-mentioned treatise,

\* See halftones.

which ran through several editions, all of which are scarce, badly worn, and more costly than diamonds. So far as biographical history or contemporary allusion has to say to the contrary she may be one of those literary moon-calves of which the English have been and are still so fond. J. Blunt was one, Junius another, Veritas and Proprietas a third and fourth, and so on, each standing for an idea and each grinding anonymously his own pet axe. Maybe Jane was a medieval joke—in some places she certainly “reads funny,” but the English took themselves too seriously to joke about matters connected with the nation’s future electors. Perhaps a final cryptogramic analysis may show that Bacon when he was tired of writing Shakespeare took up obstetrics *pour passer le temps*; in fact we might adduce, but for the timely pressure of other material, internal evidences of language, thought, and important parallelisms in both works which give great weight to the contention that Bacon—in the absence of direct evidence to the contrary—must also accept the responsibility for the writings of Jane Sharp. Should such prove actually to have been the case, it is not difficult to believe that the great Elizabethan preferred to have this work published posthumously. The skeptical reader may be disposed to quote in connection with these speculations a certain comment of Cornelius Solingen—“dass solches aber gewiss sey lass ich meine Gänse glauben.”

Here is a French book containing two treatises.

De l’indecence aux hommes d’accoucher les femmes. De l’obligation aux femmes de nourrir leur enfans. Paris 1708. Published anonymously, but probably written by P. Hecquet.

This is a delightful little work, 3 inches by 7 inches, corresponding to our modern duodecimos, bound in brown calf, on fine paper, with clear open French type well set and elegantly aligned. The book is filled with classical and contemporary quotations; the references, of which there are many, are carried to the bottom of the page. The French is vigorous and modern and well up to the standard of elegance in book making, and the work is put out with the certified approval not only of the usual royal inspector, but of Bosquillon of the law faculty, and Geoffroy of the medical faculty of the University of Paris. In many ways the book reflects the elegant but degenerating France of those times quite as much as does that of Mauriceau, for not only did the language attain its complete crystallization during the reign of Louis XIV, but man midwifery—against which

the book is a protest—was obtaining through the example of the French sovereign and his court a vigorous but hotly contested hold on the upper classes of society. If I mistake not, most of the facts, quotations, and arguments with which Elizabeth Nihill, who was trained at the Hotel Dieu, arraigned the accoucheurs of her own country were cribbed without acknowledgment from this little volume.

Half a century later, 1760, Elizabeth Nihill, Professed Midwife, published through A. Morley at the Gay's Head, London, "A Treatise on the Art of Midwifery." This is a modern-looking octavo present copy probably rebound, unillustrated, printed on good paper in large clear type, and dedicated "To All Fathers, Mothers, and likely soon to be either." Within is "set forth the Various Abuses of the Art of the Midwife, especially as to the Practice with the Instruments, and serving to put all rational Inquirers in a fair way of very safely forming their own judgment upon the Question: which is the best to employ, in cases of Pregnancy and Lying-in, a Man-midwife or, a Midwife?" The book is divided into two parts. In Part 1 she gives, through the medium of fourteen objections and answers, her somewhat heated views on the subject of men-midwives. In Part 2, she gives us a series of "Observations on labor and delivery, including a description of the pretended necessity for the employment of instruments," and continued observations—by this time superheated—on the objectionable individuals discussed in Part 1. In fact, Delacoux calls her book "a treatise on obstetricians rather than obstetrics." Our remote and respected obstetrical forefathers Hippocrates, Galen, Guillemeau, Dyonis, Bienassis are none too gently handled, but on her contemporaries—Mauriceau, Deventer, De La Motte, Palfin, Levret, Velsen, Roonhuysen, Vanderswam, the Chamberlens, Lowder, and all the others of the tribe of Pudendists and clandestine users of "that infernal instrument" and its ancestors—she lets herself loose. They are no better than itinerant corn cutters, bone setters, couchers of cataracts and stone cutters. And on poor Smellie, her countryman and rival, "whose hand was large enough to clean out the crater of Vesuvius," and who taught obstetrics in six weeks to a gaping class of yokels for six and six apiece through the medium of a hollow manniken tenanted by a bladder distended with small beer, she descends like an avenging fury. She jeers at the anatomists for believing the story of the Rabbit-Woman of Godalmin, and solemnly accuses Ambroise



Pare of having palmed his trump card—the rediscovery of podalic version—from the midwives of the Hotel Dieu. Mrs. Nihell's book is the best known and most characteristic representative of the innumerable English polemics written in the eighteenth and nineteenth centuries to stay the advancing tide of man-midwifery. Had she lived two centuries earlier her propensity for scolding might have made her a candidate for the ducking stool.

And now before going into real obstetrics the writer must confess humbly that his obsession by these volumes and their contents has taken yet another form—still in its essence non-obstetrical. Man may have *practised* obstetrics long before he had a language, even though Elizabeth Nihell tells us\* he was nothing but an interloper from the first, but before he ever *studied* obstetrics he must have had a language in which to clothe his thoughts. Then why not browse by the wayside just a little, in true Shandyan style, among the rich herbage of etymology and syntax springing up or withering among these pages? One may write history from words, and why not obstetrical history just as well as any other? And although these brief observations are of necessity fragmentary and discursive, the writer trusts that in thus following at a respectful distance in the footsteps of Max Müller he may stimulate a renewed interest in the study of our medical language.

Even the most casual student of philology will find his attention arrested on every page of these books by two especially noteworthy variations of the language from its present form:

1. The survival into eighteenth century medicine of many ancient and respectable words which have since totally disappeared from polite dictionaries. Many of these words appear to modern readers as strange and altogether meaningless vulgarisms.

2. The relation in which the so-called "dead languages," and especially Latin, were standing to the mother tongue in the rapid

\* And proves her thesis with the usual texts. She admits that Eve's emergency must have made Adam the first midwife, but disproves the modern contention that hence his title must have descended in the male line, by adducing documentary evidence to show that this title was immediately extinguished by the refusal of his immediate descendants to recognize any binding force in his example. "The Israelites did not use men to lay their women," Genesis 35:17, 38:27; also Exodus 1:15-22. Her argument is cogent and suggestive, and should convince anyone open to conviction. A certain J. Blunt who wrote about the same time, also takes occasion to remind her brethren of the humiliating fact that in all the animal kingdom the male of the "obstetrical frog" (Reaumur) is the only one to officiate at the delivery of its young.

development which scientific nomenclature was undergoing during the seventeenth and eighteenth centuries.

This was a language period in which the processes of word evolution were actually visible on the surface. In our day the equilibrium of all language, both as to etymology and syntax, is quite stable; the elegant Latin has not only permanently crowded out the humble Northern and Anglo-Saxon mother tongues, but like an arrogant upstart has finally brought them into contempt. In that day the medium was turbid with old roots and undifferentiated synonyms which had not yet settled to the bottom, and with new words and forms which had not yet entered into solution. The language boiled with the warfare of incompatibles. The examples which have been selected almost at random from these books are illustrative of this philological conflict waging in the medium of scientific expression.

In the new development which language had taken on in response to the stimulus of the printing press on the one hand and the free growth of thought achieved by the reformation on the other, there was little notion of either philological exactitude or consequences. The real tendencies of language were—as they probably remain to-day—unconscious and unguided ones; there was no science of philology and no encyclopedists to enforce rigid rules of form, and printed letters and words were but the media of vocal speech on the one hand and of ideas on the other, to be added to or taken from as the occasion of the moment required. The language was rich, impure, mutable. Hence, arose either easy changes of spelling to interpret various changes or ideas of sound, or substitution and addition of words to meet changed or added meaning.

And yet, in all these changes of words and inflections it is surprising to note how few changes have occurred in the syntactical skeleton and thought sequences of either the German or English languages. In like manner, old prepositions, conjunctions, and other linkwords have survived in all Gothic languages with scant change in pronunciation and but little in spelling, so that the root remains but slightly obscured; e.g., and, unnd, und, undt, un; bey, by, bei, beym; uf, auf, up; vor, wor, for, für; worbey, etc.

On the other hand, although many changes in the old, very liberal, and often irrational spelling of inflected words were but slight, to keep up with slight changes in sound, the change was

sometimes sufficient to obscure the root: e.g., the *pouched*\* egg easily became the meaningless *potched* or *porched* egg.

In many German words the root spelling has been changed and confused, though the sound is little altered; e.g., *echt* was to *etwas*; *ohngefehr* to *ungefär*; *sweer* to *schwer*. In others, the root has become almost unrecognizable through changed spelling to meet degenerated pronunciation; as, *itzo*, *sintemahl*, *verwittibten*, *geblibenen*. These changes are especially noticeable in the numerals and their derivatives; e.g., *vierdte*, *eilff*, *zwo*, *viertzehen*, *andertheil*, † *viertheil*.

In other cases, the word became simplified both in pronunciation and spelling without change in root or meaning; e.g., *wünsche* to *wünsche*; *Brandewein* to *Brantwein*; *nimbt* to *nimmt*; *Tummheit* and *Teutsch* to *Dummheit* and *Deutsch*; *Guttsche* to *Kuttsche*; *spraach* to *sprach*; *privy* became *private*, and *privities*, *privates*.

The old English *assoon* and *chafindish* and the old German *Kanstu*, *wirstu*, *fühlstu*, were survivals of the Gothic tendency to couple words together in written language when the spoken language did the same. And yet the old Germans said *zu rücke* instead of *zurück*.

Along with these minor changes in the common linkwords and vernacular skeleton changes which may be described as gradual and natural, the language of science was undergoing a radical and somewhat catastrophic evolution, not only because of the addition of new material requiring new words, usually nouns and verbs taken bodily from the Latin to meet the novel conditions, but through the substitution of scientific Latin for old vernacular nouns and verbs. It is easy to trace this change in old German, for before the Latin words became effectually and permanently welded into the printed language it was the custom to spell the Latin root in the Latin characters, and any local addition to the word was printed in Gothic. Here is a short list of these words taken at random from a German seventeenth century book: *penetrir/en*, *accelerir/ung*, *tractir/en*, *citir/en*, *adhibir/ung*, *author/s*, *probir/et*, *chirurgi/sche*, *operatio/nen*, *patien/ten*, *effectui/ren*, *præsupponi/re*, *auctori/tät*, *phantasi/ren*, ‡

\* From the old French *pocher*—to break out.

† Other part, *i.e.*, part two.

‡ Applied in this case to the delirium of a woman seven days in labor with a still undelivered dead child. There is a considerable philological gap between this German word taken bodily from the Greek *φαντασία* and the English word *fancy*, but the gap is spanned by *phantasy*, *phantast*, *phantastic*; and in an old volume written in the fluid English of the seventeenth century, we catch the word in the very act of transmutation—*phant'sy*.

medico s. Most of these words have now permanently replaced those of Northern origin, and it must be admitted that the substitution has strengthened the language by making it more exact and formal. On account of the early adoption of the Latin characters in the written language the English door has always been open for Latin words, which were thus easily assimilated without the probationary period required in the German.

Sometimes the Latin or Greek underwent queer changes simply in passing through unfamiliar lips or pens; e.g., sphincter became sphyster; chyrurgeons became chirurgeons, and later surgeons; dyet became diet; the urachus came into English from Greek through the French as *ouraquet*\*; in somewhat the same way *afterbirth* was corrupted to *after-burthen* through contact with the German *After-Bürde*. The Latin word *carbunculus* (little live coal) found a ready lodgment in both German and English tongues, but the German added an extra twinge of pain to the thing, corrupting it into *Karfunkel* (*funkel*, to sparkle or twinkle).

The German language has resisted the encroachment of the Latin much more effectually than the English. Several factors have united to maintain the German and to break down the English: 1. The English was almost from the first a composite language which found it easy to take on modifications; 2. The English use of the Latin characters in the written language; 3. The national solidarity of the Germans in custom, orthography, race and folk spirit, and resisting power. Even to-day a strong feeling against philological intruders exists in Germany, from the Kaiser down, with the result that while the folk tongue has almost entirely dropped out of the English, the German language is still rich enough in old nouns and verbs to be able to replace itself almost completely were all Latin words to be withdrawn. For example, gebär-mutter, eierstock, eier-leiter, hoden, scheide, affter, kinder-mutter, wöchnerin, seitengeburt, geburtsstrasse, monatskind or mondkalbe, † mutter gewächs, etc. Few old words, if any, representing these ideas are still to be found in working order in the English language; their English ideas exist at present in no form other than Latin. The middle English had an equivalent for *mondkalbe* in *moon-calf*, which has come down to us in Shakespeare's half-human Caliban:

\* Thus spelled by Hugh Chamberlen.

† The Latin *falsum germen* was also sometimes used, and has been rendered into literal English as "false conception."



Ste. "How now, mooncalf! how does thine ague?" and

Trin. "I hid me under the dead mooncalf's gaberdine."

Tempest II: 11.

But the true meaning of the English word is lost without the intervening German word *monats-kind*, meaning month's child, moon-child,—a conception thrown off at the monthly period. The Latin substitute *mole* is scientific, but sadly lacking in pictorial or traditional quality.

But although the English tongue has never added any new words of Anglo-Saxon origin since the Latin gained a foothold, the virility and beauty of the old language has enabled it to make a hard, though losing fight for its own parts of speech. Probably the last of these common English words will before many generations become obsolete, with the latinization of all scientific words in most modern languages. And yet it would be a pity, for example, to lose the very old Anglo-Saxon word *womb* out of the English. This word will probably go, eventually, except as it will always remain with us as an indispensable root-word in *woman*, for though we find it in the Danish, Gothic, Swedish, Icelandic, etc., the root has no place either in German or in the Romance languages. Midway, however, between the Anglo-Saxon *womb*, meaning belly,\* and the more narrow Greek word *μῆτρα* meaning the organ itself, a curious temporary interposition took place; the English and French languages took up with a latinization of the Old German *Mutter* which, as *Gebähr-mutter* still has a dignified place in the pages of German scientific text books; the *womb* became the middle English, French and German *matrix*, and remains so in French to this day—*matrice*.

This total extinction of almost all Anglo-Saxon words for the procreative organs is most interesting. In the old books, the testicle and the ovary were alike *stones* or *seeds* and later on became latinized both in German and English, and at first without sex discrimination, into *testicle*.† The pelvis was *basin* or *becken* and the pelvic bones were *share bone*, *hanch bone*, *holy*

\* Writers as late as Chamberlen called pregnancy "Great Belly."

† Jane Sharp says, "I have seen one seed of one woman, and but one, and that is more by one than many men have seen." The word is used often in another sense, as by Mauriceau; "the Fallopian trumpets are ejaculatory vessels made rough so that the (male) seed may not run back." Note that Mauriceau reverses the action of the cilia! and is altogether at sea over the functions of the "ragged piece." This was before the day of Leeuwenhoeck.

*bone* (*heiligenbein*, os sacer\*). The scrotum was described by Jane Sharp as the Codd. This word is Anglo-Saxon, and in Middle English is Codde, in Icelandic Coddí, in Welsh Cwd, in Low German Koden, and means belly, sac or paunch. The writer has noted its occasional use in this country in modern vulgar dialect. Jane Sharp called the male organ the Yard, and the glans was the Nutt of the Yard. Yard is an Anglo-Saxon, Gothic, Icelandic, Scandinavian word from gyrd, a rod or twig, or spear and has an enormous number of derivatives. For example, the word came early to mean a unit of measure, hence an enclosed or measured space, g(y)arden and orch(y)ard; the word actually exists in the Russian language in the name of the city Nijni Novgorod, which was originally built around an enclosed space for holding a fair. See also Yard arm.

Still quoting from Jane Sharp, we confess to being somewhat startled by the following choice specimen of Middle English. "If the child comes Arsewards or Buttocks first, lay her with her head lower than her Bodde."† The phrase "to lay a woman" from the Anglo-Saxon *leggen* and Middle English *liggen* was synonymous with "to confine,"‡ and together with the companion phrase "to bring to bed" remained in common use until the beginning of the nineteenth century when both became obsolete, together with the old expressions "to take" or "to try a pain," meaning to assist or examine during a pain, and to "touch," meaning to examine. The old medieval English "to lie in" is obsolescent though it will last a long time yet in *Lying-in Hospitals*. As for the fifth word in the quotation, it is a survival of one of the oldest words in written or spoken language, going back to a root not only common in all Northern tongues, but even also to be identified in a slightly modified form in the Greek *oppos* or *oppos*. The word still survives in fairly decent German.

An old Anglo-Saxon word which is probably too closely inter-

\* The old Latin words for epilepsy (*morbus sacer*) carry the same significance, but this is again lost in the common German words for the disease—*schweren Noth*.

† She had the same fondness as Shakespeare for monosyllabic Anglo-Saxon, for example, her injunction to "annoint the parts with fresh butter to make them *glib*" (from Old Dutch *glibben*) suggests the witches' cauldron in *Macbeth*:

"Make the gruel thick and *slab*."

The rupture of the hymen, says she, "is said to put maids to a squeak or two, but 'tis soon over."

‡ The two words *leggen*, and *confine*, from the medieval Latin *confinare*, have distributed themselves into modern language in several directions. Thus we find *leggen* in the English and French word *lecture* though the intervening Latin *lectus*, a couch. It occurs again in the French *lit*, a bed, and we may see it in process of transmutation in the writings of Louise Bourgeois as *lict* where the Latin "c" is still in the written word, but silent. *Confinare* has become the German *entbinden*, the sense of the word being accepted literally but without any transfer of the root.

woven with history and literature ever to be driven out of the language, is the English word for cranium—*skull*, *scull*, *sculle*, *skulle*, *schulle*, back to *skaal* and the Icelandic *skal*—a pan, bowl or goblet, and the *skaal* of the hard-drinking Norsemen. Here are Jane Sharp's thoughts on embryology: "The scull and whirl bones are made first, but farther than that I have nothing to say, for I love not impertinent disputes like those Grecians who contended largely whether the elephant's tusks were horns or teeth."\*

Another Gothic or Anglo-Saxon word which survives to this day, both in English and German, in spite of the Latin *umbilicus*, is *Navel* or *Nabel* from *Nafela* and *Nafu* in Anglo-Saxon, *Nabula* in Gothic, *Nafli* in Icelandic, and *Nafle* in Swedish, meaning the central point. In the seventeenth century the Latin word for navel had not yet been introduced into either the English or German, and neither language would now suffer through its absence. An interesting philological query arises in connection with this Gothic word—does the nave or axis of the Gothic church take its name from our word for navel or does it go back to the Sanscrit *nau* through the Latin *navis*—a ship?†

A word which has carried its Northern ancestry with it all over Europe is the Scandinavian word *Schorbauch* or ruptured belly, which has become *Schorbuyck* in Dutch, *Scharbock*‡ in German, *scurvy* in English, and *scorbute* in the French. The disease came into Europe from the North with the armies of Gustavus Adolphus and Charles XII, and the Scandinavian name for it was rendered from Low German into the medieval Latin *scorbutus*, hence *scorbute*.

And now, to wind up this philologico-obstetrical digression, here is a quotation from Mauriceau (translated by Hugh Chamberlen) containing a word which gave the writer an exciting paper chase. "Many Women could not keep themselves on their Legs immediately after they were brought to Bed, were their Pelvic Bones disjoined or separated during Labour—I noted that very well in the Hostel de Dieu of Paris, in the many I have layed there. When women that were to be brought to Bed, began to be in Labour, they went into a little Room called

\* Not such an ancient sort of discussion after all—a theological writer of the early nineteenth century raises the cognate question "whether leopards and mules could properly be called creatures."

† Canon Trench thinks the word is from *nau*, *navis*, preserving as a symbolism the old word almost in its original form; but some philologists take the alternative viewpoint.

‡ *Sommern*, loc. cit.

the *Stove*, where all were delivered upon a little low Bed made for that purpose, where they put them before the Fire; afterward, as soon as it was over, they were conducted to their Bed, which was sometimes a good way off from this little Chamber, whither they walked very well; which they could never have done, if their Os pubis, or those of the Ilia, were separated the one from the other." "The Stove!" The casual reader might suppose the ladies temporarily sojourning in the Hotel Dieu applied this somewhat suggestive epithet to the confinement room on account of recollections not altogether unassociated with the idea of fiery torment. Not so—the word *stove* meant in Anglo-Saxon and Gothic simply a room, and later, a room heated for a bath or other purpose. The word was *stofa* and survives in the German as *stube*. In middle English *stove* meant simply a room. The old German midwives used *stowen* to heat the *stuben*. In old Dutch hostelrys the heated common room was The Stove. Truly the drifting sands of English philology have to be shoveled out of the smoky old Anglo-Saxon *Stofa* before we can recognize the ancestor by marriage of our modern base-burner.

This word occurs with the same meaning in the documentary record of a certain episode in the stormy life of the third Dr. Peter Chamberlen—the father of the translator of Mauriceau.\* In 1649 the House of Lords granted him an ordinance for constructing "artificiall bathes and bathe stoves." The stoves referred to were rooms or buildings to be erected for the purpose of accommodating public baths. This ordinance went to the House of Commons and after reference to the "Colledge of Physicians," was not concurred in because the "Colledge did not think the erecting of publike bathes should be granted to Dr. Chamberlen because the Colledge thinks them hurtfull to the common-wealth." Among the reasons given by the college for believing the baths hurtful is that "by their abuse they were the cause in the Greek and Roman cities of so much physicall prejudice in effeminating bodyes and procuring infirmities, and morally in debauching the manners of the people, yet in three of them upon the coming of the Christians into power they were demolished or converted to other uses." Other reasons were put forth by the learned faculty for refusing to endorse the baths. For example: "This country is too cold."—"The Bathes will

\* See Aveling, "The Chamberlens," Churchill, London, 1882; pp. 60-77. Dr. Aveling reproduced the document without comment on the difference between the medical and modern meanings of the word.



be a monopoly."—"They may be the cause of Sinne."—"They are remedies for the French disease," etc. These reasons were all well enough, but the real reason why the faculty did not want the ordinance passed was because of jealousy of the Chamberlens who, for four generations, were physicans-in-ordinary to the Stewart dynasty, and later served William and Mary and good Queen Anne in the same capacity.

607 RUSH STREET.

### UMBILICAL CLAMP.

BY

B. B. WECHSLER, M. D.,

Obstetrician, Montefiore Hospital,  
Pittsburg Pa.

(With one illustration.)

I DESIRE to present to the profession a little device for use on the cord instead of the usual ligature.

The figure shows the clamp which I have had made for this purpose and which I have now used on over 250 cases without complications and with perfect satisfaction.

The method of clamping the cord and dressing without ligature, I first saw in the Schauta Clinic in Vienna during a recent visit.



FIG. 1.—Clamp for umbilical cord.

My clamp while carrying out the same idea is, I believe, more practical since there they use an ordinary Hemostat for the purpose, which on account of its size is cumbersome and often when resuscitation is necessary severe traction is made on the stump of the cord which predisposes to umbilical hernia.

The method for clamping is more advantageous than that of

ligature, because: 1. It lessens the danger of infection; 2. it insures hemostosis; 3. is conveniently handled.

Clamping the cord is accomplished in the following way: 1. Wait until pulsation has ceased; 2. clamp cord about one inch from umbilicus; 3. cut cord even with clamp.

The infant is then removed by the nurses and the clamp allowed to remain on stump of cord for fifteen minutes, or about the time the placenta has been expelled then clamp is ready to be taken off.

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## ITEM.

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DR. JOHN F. WINN, of Richmond, Va., for the past several years the professor of clinical obstetrics in the University College of Medicine, was further honored by its Board of Trustees in annual session, by his election as Professor of Obstetrics.

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## TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.

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*Thirty-seventh Annual Meeting held at Baltimore, Maryland,  
May 28, 29 and 30, 1912.*

*The President, DR. HOWARD A. KELLEY, Baltimore,  
in the Chair.*

The society met in the Assembly Hall of the Medical and Chirurgical Faculty Building, and after an address of welcome by Dr. William E. Mosley, Baltimore, which was responded to by Dr. Brooks H. Wells, New York, the reading of papers was begun.

DR. PALMER FINDLEY, Omaha, Nebraska, read a paper on

MENSTRUATION WITHOUT OVARIES.\*

### DISCUSSION.

DR. J. CLARENCE WEBSTER, Chicago, thought that all had had the experience of hemorrhage occurring after the removal of the ovaries; that they had even had the experience of hemorrhage occurring from the cervix after the removal of the body of the uterus. He believed that a considerable percentage of these cases in which the hemorrhage was irregular might be explained

<sup>1</sup> For original article see page 44.

either by the vascular degenerations in the uterine or ovarian arteries or in both, or in varicose veins of the broad ligaments. He could only recall one case in his experience where a regular flow suggestive of menstruation occurred after castration. He did not believe that Gellhorn's suggestion of adhesions was explanatory of such cases. He thought Dr. Findley's last suggestion was probably the important one—namely, the retention after the operation either of portions of the main ovary of the stump, or, what was more likely, where good surgery was carried out, the existence of small portions perhaps not even macroscopic in the broad ligaments. He believed that there was aberrant Müllerian tissue in the pelvis. He also believed that there was aberrant ovarian tissue which had been clearly demonstrated macroscopically when portions of the size of a millet seed or pea were found, but it was not surprising when one considered the course the ovary took in its development that there should be small portions invisible perhaps to the naked eye left along the track, and therefore it was not surprising that the menstrual habit might be kept up after years where there was thought to be complete castration or even pregnancy might occur.

DR. HENRY T. BYFORD, Chicago, referred to and emphasized the importance of the testimony of the patient. He recalled a patient in whom he removed the uterus and ovaries, and the woman said she continued to menstruate. He cut off the internal os, but upon careful examination he found it was not exactly every month that this discharge began. The woman would have a little discharge between times. He told her to lie down a good deal, and if the discharge continued she was to return to see him. She wrote him that she was menstruating. She would have a discharge of blood at one time at the end of three and a half weeks, at another time at the end of four weeks, and he told her to pay little or no attention to the little flow between times. There were a great many cases that were not menstrual in type, that is, they had not the menstrual periodicity.

With regard to adhesions, he found in nearly all of his cases there were adhesions. He thought these adhesions could produce a discharge of blood. All had had cases of adhesions in which the chief symptom was hemorrhage. In talking to medical students he told them there were the hemorrhagic and the painful cases, except the hemorrhagic cases did not have much pain, and the patients who had much pain had very little flow. He had cured some patients by having them lie down and rest for a long time. There was nothing more established in his mind than that adhesions interfered with the circulation by increasing it or damming it up, thus producing a bloody flow from the uterus, but this was not strictly menstruation.

DR. J. M. BALDY, of Philadelphia, would like to emphasize not only the statement of the patient, but the statement of the doctor as to what was menstruation. Dr. Byford had covered

very fully the unreliability of the statement of the patient as regards menstruation.

The speaker called attention to the statement, for instance, of a notable New York surgeon who transplanted ovarian tissue and called the discharge that followed menstruation. It was a mere show of blood which disappeared in a short time. Everybody now knew that it was not menstruation at all in the strict sense in which menstruation was recognized.

Concerning the far-fetched theories in regard to the causes of this matter, there was nothing that appealed to him. Take, for instance, the last theory put forward by the essayist of aberrant ovary; that because a woman menstruated, therefore ovarian tissue should be left; that because a man committed a crime, therefore he was insane. This line of reasoning was faulty. Dr. Webster's suggestion in the beginning of the discussion appealed to him as being much more potent than any other in explaining these aberrant bleedings; he would call them, as he would not dignify them by the name of menstruation, the result of the degenerative changes in the vessels themselves in the pelvis. As a matter of fact, when these patients told us how long they menstruated, or how long they had stopped menstruating, it was found they all stopped in a limited length of time. He had never known a case go more than a year and a half at the outside. In a few cases the patients may have gone longer than that. They were not cases in which there were adhesions, and there was no considerable portion of ovarian tissue left to account for the continued menstruation, if it were a real menstruation in that individual case.

DR. FRANK T. ANDREWS, Chicago, recalled an interesting case, although all of the details were not clear in his mind. There was a family of four girls, and incidentally there were two sons. One of the sons was a very tall man and was deformed by a talipes equinovarus. The other son, as he grew up, became a banker. While this was not gynecological, it bore a little on the family history. The four girls were referred to him by a physician from Wichita, Kansas, who had operated on one girl after marriage for a large ovarian tumor, he removing her ovaries. Another girl after some years of treatment he had likewise operated upon and removed her ovaries, and she had a normal change of life, with a normal result in that case, namely, stoppage of the flow. Then the family moved to Chicago and here were two girls suffering so severely with dysmenorrhea that, after caring for them and striving to avoid operation for several years, after having the best advice he could get from his gynecological and neurological friends, he decided to operate one of them. Finally he did so and she made a normal recovery. The first one operated on improved very much for about nine months, but she kept on flowing apparently normally. The operation consisted in removing one ovary, leaving one ovary, and removing both tubes. After the dysmenorrhea returned, upon exam-



ination he found she had developed a year and a half after the first operation an ovarian tumor in the remaining ovary. He operated and removed that, and in carefully looking over the field he discovered there was a little stump he had not taken out on one side for some reason; he had not cut in and taken the whole tube out from the cornu of the uterus. So he removed that. The other one was thoroughly removed. He removed the tumor and she continued to menstruate. About three or four years later he removed the bulk of the uterus, leaving the cervix; the woman continued to menstruate, and for somewhere in the neighborhood of four years, from that time until now, this woman went through exactly the same nervous disturbances every month that she used to go through while menstruating, but she had ceased to flow. He had had four neurologists examine this patient at intervals, and there had not been a single symptom of hysteria. That element was cut out of the case.

DR. EDWARD P. DAVIS, Philadelphia, pointed out that recent studies to settle the vexed question of the time of labor threw light upon the subject under discussion. It was found that the physiological life of woman consisted in periods of accumulation of blood terminating in increased pulse tension and in hemorrhage; that this condition was independent of the presence of genital organs, that is, the genital organs might be removed and this established physiological habit of woman still continued. In some cases the persistence of this discharge and increased pulse tension was the result of disorder of the ductless glands, and some cases were improved by the administration of thyroid extract or pituitrin or adrenalin. He thought this would explain some of the cases in the discussion where the absence of genital organs by operation had been followed by continued hemorrhage. The hemorrhage would occur from a physiological standpoint in any organ lined by mucous surface and richly supplied by subjacent capillaries, and in the absence of uterine mucosa hemorrhage was seen that was familiar also from the nasal cavity, sometimes from the gastric mucosa, and sometimes from the intestine, and rarely in the hemorrhages underneath the skin which had, when complicated by hysteria, given rise to those interesting cases of alleged bloody sweat and supernatural manifestations.

DR. CLEMENT CLEVELAND, New York City, was entirely in sympathy with Dr. Webster and with Dr. Baldy about these menstrual discharges of blood. It was not an indication, of course, that this discharge of blood was really menstrual or really from ovulation. He was reminded of a case he had some years ago where it was reported that both ovaries had been removed, and still the woman menstruated. It was a case in the Woman's Hospital in New York, and his confrère, who had done the operation, had died in the meantime. The patient, therefore, came into his service, and he looked up the history. There

was a miscarriage at the fourth month. The history showed that both ovaries had been entirely removed. He had very little faith in the functional activity of supernumerary ovaries, and he came to the conclusion that in most cases the discharge was due to a small portion of the ovary having been left behind. He was very positive it was in this case. Perhaps the woman had conceived; she had no evidences of the menopause, and she was missing the fourth month. She recovered completely, and then he thought of two typical cases where he removed ovarian tumors. It was very nearly seven years ago he had a young woman under his care, a graduate of Welsley College, twenty-one years of age, who presented herself with two ovarian cysts, one on either side, both being pretty good-sized tumors. He opened the abdomen and removed both cysts and both ovaries. In examining the ovaries he saw nearest to the ovarian ligament what appeared to be normal ovarian tissue, and in both of these ovaries he was careful in taking out the cyst to leave these small portions of ovarian tissue. The woman recovered completely from the operation, and although it was nearly seven years ago, as he remembered, she had menstruated regularly since that time. He had examined her from time to time; there had been no decrease in the size of the uterus, and she appeared to be going through the normal function every month. As he remembered, she had not skipped a month. He was asked what he thought of her marriage. He thought the matter over carefully and as she and the young man were very fond of each other, he gave the young man to understand that she possibly might not have any children if they should marry. However, they married. He had not heard of any pregnancy, and he did not know that he looked for it.

In the next case that occurred years ago he removed two ovarian cysts of considerable size from a woman in whom he had removed the right ovary completely. He found he could leave a portion of the left ovary about the size of a pea, and this woman had already borne several children. She had menstruated regularly, and if there was one period during the last two years which she had skipped for two months, that was all. She was now menstruating regularly; he had examined her from time to time. There had been no decrease in the size of the uterus; her menstrual function was apparently perfectly normal, and there was no indication of the menopause.

DR. SETH C. GORDON, Portland, Maine, said that Dr. Davis had struck the keynote in reference to this whole matter. Personally, he had reported two cases where pregnancy took place after as careful a removal of both ovaries as possible. One of these cases occurred in the practice of Dr. Chadwick, of Boston, who had assured him that he was certain he removed every particle of the ovary, and Dr. Gordon felt just as certain that he did likewise in his case, and yet both women bore one child each about a year and a half after the operation. He removed the

ovaries of a young woman and she still continued to menstruate. Two years afterward he removed the uterus supravaginally and she still continued to menstruate. Two years later he removed the cervix and that stopped the menstruation, but menstruation was absolutely regular during the time that the cervix remained. So he believed that a physiological congestion actually occurred and that accounted for the regular menstrual period.

#### CHRONIC CYSTITIS OF THE TRIGONE AND THE VESICAL NECK.

DR. EDGAR GARCEAU, of Boston, read a paper on this subject, and reported the case of Miss W., aged fifty-eight years, first seen in October, 1909. The patient herself was a nervous high-strung woman who liked to have her own way. When he first saw her she was complaining of frequent painless micturition. There was a constant desire to urinate which gave her no rest day and night. She could, when she had to, hold her urine, but as a general rule micturition was required ten or twelve times a day and several times by night. There was no tenesmus and no hematuria, and there was no history of stone.

After giving further details of the case, he said the diagnosis of this case was chronic cystitis of the trigone and vesical neck and urethritis. The etiology was probably hyperemia of the bladder with secondary infection. The hyperemia was probably due to old retroversion.

The writer has been observing many of these cases during many years and has arrived independently at practically the same conclusions regarding them as Knorr and others. He has long felt that neuroses of the bladder with which this affection often is confounded by the inexperienced must be exceedingly rare, if they ever occur. The term "irritable bladder" in the female, which was a favorite classic expression of the writers of a generation ago still survived them. It should be abandoned, for it is not a disease, it is a symptom. The author has never seen a neurosis of the bladder. In the family history of these individuals will usually be found some hereditary taint, such as alcoholism, gout, rheumatism, epilepsy, diabetes and insanity. The disturbed nervous system in patients with chronic cystitis of the trigone and vesical neck is a result of the disease and not the principal affection. They are neurasthenics and often hypochondriacs, but not for any other reason than that they are constantly suffering physical pain and distress. This is so with many other organs in the body, notably the intestines, whose disturbed mechanism in consequence of a ptosis or an unrecognized partial obstruction, so often gives rise to profound toxic consequences, chief among which is derangement of the nervous system.

Chronic cystitis of the trigone and vesical neck is always ushered in by frequent micturition. The writer is sure from long observation of these cases that the disease often starts as a simple hyperemia of the trigone of the bladder, which has taken its origin in consequence of hyperemia of the pelvis which is due



to some pelvic disease, and that the first symptoms are those usually experienced with vesical hyperemia. This will be referred to again in discussing etiology and pathology. Usually, therefore, the early history will be one of frequent, painless micturition, especially during the day time. By night the patient will not perhaps be obliged to urinate at all, at most not more than once or twice. During the day she may have to empty the bladder every hour or even oftener. Later in the course of the disease pain may accompany urination, and it may be felt before, during or after the act, its seat being in the bladder. There is sometimes tenesmus. If there is ureteral pain it is probably due to the urethritis which the writer believes is always present in this disease. Even late in the course of the disease there may be no pain whatever, and the only symptom may be the frequent urgent desire to urinate. Occasionally there may be a little blood in the urine which may be visible to the eye; it is never present in great amount and is rather a rare symptom. The urine, even in long-standing cases, may be perfectly clear and the sediment very slight. The urine is sometimes cloudy in cases in which there are marked vesical lesions. Clear urine is found in cases in which there is a smooth mucous membrane over the trigone, and cloudy urine in those in which the membrane has undergone marked pathologic changes. Sometimes there may be considerable trigonal changes and still the urine is clear and without pus in it. The writer recently had a case of this kind in a woman, fifty-five years of age. Her trigone was covered with a bright red elevated mass of tissue, resembling granulation tissue, and yet her urine was absolutely clear and contained only a few squamous cells; pus was absent. Examination of the sediment should be done with the greatest care for it is of great diagnostic importance. A clear urine should be allowed to stand for several hours in a large amount. The whole sediment is then taken up with a pipette and is centrifugalized. It will show almost always an excess of epithelial cells, squamous, small round and medium round, sometimes one variety alone, and sometimes all together. There may be a little mucus. There may be a little microscopic blood and a few pus corpuscles. The pus may be entirely absent. In the cloudy specimens we get more mucus, more cells, and more pus. The absence of pus is what has thrown so many physicians off the track in the diagnosis of this disease. Failing to find pus, with a clear urine, they conclude that there could be no inflammation. Hence, the diagnosis of a neurosis. The cystoscope alone can diagnose these cases. It will be shown later that in many of the cases the epithelium is intact; hence the absence of pus. The bladder is not the only part of the urinary tract that may be inflamed and yet pus be absent. The author has shown that in ureteritis in the female there may be no pus in the sediment collected with an oblique Kelly cystoscope with the patient in the knee-chest position. The author believes that the presence of pus, even if there are only one or two corpuscles



to the slide, is of great diagnostic importance, especially if there are also a few blood corpuscles.

Perhaps the most serious feature of the disease is its long duration which entails a severe degree of neurasthenia and reduces the patient to a pitiable state.

In the cases in which the disease is submucous in character without superficial lesions, local treatment is not only of no avail, but harmful. A vaginal cystotomy must be performed and the top layer of the trigone dissected or cureted off through the diseased tissue, in the manner described. The after-treatment is the same as that just described.

The prognosis of this disease should in all cases be guarded if the disease has been of long duration. Early cases do well for the inflammation has probably not gone deeply into the tissues. In the late cases we have not only a diseased bladder to correct, but a disorganized nervous system. The well-to-do who can afford the time and expense of a long sojourn in the hospital under competent care will stand a better chance of recovery than the poor woman.

#### DISCUSSION.

DR. HENRY T. BYFORD, Chicago, stated the very fact, as pointed out by the essayist, that local treatment did not help would indicate it was medical treatment that was needed. He had had cases that he had treated medically which came from faulty conditions of the urine, but he was not able to help them materially in a week or two weeks, but by keeping track of them for six months he had cured them. There was something in their habits and in their method of eating which occasionally caused a variation in the urine which the practitioner did not always correct. There might be hyperacidity crystals the result of faulty metabolism. Persistent medical treatment was sometimes neglected by gynecologists as well as by other practitioners who devoted their attention to surgical diseases.

DR. HOWARD A. KELLEY, Baltimore, said there was nothing so close to him as the subject of trigonitis. Ten or twelve years ago a German confrere objected to the word, but the trigone was a well-defined anatomical landmark, and it might become inflamed in some cases, but not in all. We must not call all of these cases trigonitis. Some of these cases had been the distress of his life, so far as treatment was concerned, while others were gratifying to treat for the reason that they got well so promptly. As a rule, very little pus was found in the urine or none at all, and he had never found organisms. If he found organisms in the urine he examined the kidneys. In those cases Dr. Garceau had been speaking of, the irritation might start inside and leave a real trigonitis due to irritability of the trigonum or a hyperemia. We did not find fissures in this group of cases. He had seen polypi in this group. Sometimes the hyperemia was more or less intense. He recalled one case in

which absolutely nothing could be seen. He had relieved the patient some, and this was the reason she came back, but he was not able to cure her. He found in a number of cases hyperacidity, and when this was corrected, occasionally the patient got marked relief. He apprehended this condition was at the bottom of a great deal of the trouble with children. He found the hyperemia extending down into the urethra, but rarely any inflammation of the urethra. When he found an inflamed urethra, he did not class the disease as belonging to the group of cases under discussion, and so he left out urethritis. If there was any pus in the urine or organisms, he looked into the ureteral tract for latent tuberculosis.

As to what to do, he agreed with the essayist that hygienic measures were most important, and it was a matter of early treatment. As a rule, these patients were neurotic individuals. They got better and they got worse, and we could not always say why. The patient he spoke of as having been under his care for so long had a period of comfort for two weeks, when she felt secure, even expressing herself as being entirely relieved. He tried curetage in the old days, but he did not resort to it any more. He had tried scrubbing. He had also tried puncture, using an instrument with a number of points, but that did not do any good. Electricity did no good. Collargol rarely did any good. He injected novocain through a syringe into the septum between the bladder and urethra and there was a marked difference in the urethra by the speculum in the bladder, seeing where the injection was made. He injected 4 per cent. solution of novocain which helped for a time. Then he tried distention of the bladder. Patients who had been passing water every half hour or every few minutes were able to hold several hundred cubic centimeters. When he got the patients so that they could hold a good deal, they were always relieved of their symptoms.

Operations on the vagina in women who had borne children, who had more or less cystocele, were sure not to afford much relief. A great many of these patients came to him who had been promised that they would be well if the cystocele was operated on, but he did not promise relief from any operation on the vaginal side.

A word of caution. Some of the worst cases of cystitis he had had to deal with were those that had been overtreated, carelessness having been shown in the introduction of catheters, which was left to nurses who had not been trained to do this work, thus setting up a real cystitis.

After all, the sheet-anchor was nitrate of silver, a five per cent. solution at intervals of three to five days or a week.

He agreed with Dr. Garceau that this condition was one of the most difficult practitioners had to handle, and yet there was hope in every case. We did not know what cases we were going to relieve quickly and what cases were going to drag on, and one should be careful to warn the patient about that before beginning treatment.

DR. GARCEAU, in closing the discussion, asked Dr. Kelly if he would class this condition as an inflammation of the trigone, or whether he would class it as hyperemia and not part of a cystitis.

DR. Kelly said he would leave out cystitis and call them normal trigones. In many cases there was a hyperemia, but he would not call them inflammatory except from the leukocytes.

DR. GARCEAU stated that was the point he tried to bring out in his paper, that we could not distinguish between the two conditions. There was a red trigone, and one did not know. The only way to make a diagnosis was to cut a piece out and put it under the microscope or curet the bladder. If there was a hyperemic bladder, one should remove all sources of hyperemia, such as the correction of a misplaced uterus, ovaries and tubes. Hyperemias of the bladder in the early stage were amenable to treatment. If one treated them and removed the primary cause they got well, but this cystitis did not.

#### A SIMPLE METHOD OF SHORTENING THE UTEROSACRAL LIGAMENTS.

DR. GEORGE H. NOBLE, Atlanta, Georgia, said that a study of intraabdominal pressure and its effect upon the pelvic structures and the mechanism of resistance afforded by the latter elucidated the functions of the uterosacral ligaments in maintaining the uterus in its normal position. The intraabdominal pressure being equal in all directions was expended in front and behind the uterus. The difference in the force between these two points varied with the extent of surface to which it was applied. Pressure anterior to the uterus had a tendency to drive the bladder downward upon the vagina. When it was partially filled pressure was transmitted through its fluid contents in the direction of the vaginal orifice, anterior surface of the vagina and uterus, effecting a tendency to hold the cervix and lower border of the broad ligaments upward and backward. The fully distended bladder forced the uterus bodily toward the sacrum. When empty it collapsed on the anterior wall of the vagina and uterus, responding to the influence of superimposed pressure, turned forward upon it. In the normal subject the pressure applied anterior to the uterus was not equal to that posterior on account of smaller area, but served to retard the forward slipping of the cervix. This was effected partly by the ball valve action of the partially filled bladder and anteversion of the uterus above referred to.

Tendency of the force applied in the posterior uterine cul-de-sac was to dilate Douglas' pouch and put the uterosacral ligament on a strain. The result naturally was a slipping forward of the cervix uteri and changes in the axis of the uterus as it rotated around the pivotal point where the latter advanced to a position anterior to the center of the gravity of the uterus.

With overstretching of the uterosacral ligaments Douglas' pouch became distended, resulting in an increased area and



corresponding increase in pressure behind and reduction in pressure in front of the uterus. The balance in pressure was destroyed. In addition to this the loss of the ball-valve action of the bladder was noticeable, especially when the retrodisplacement had reached the stage of prolapsus. Then, in place of the partially filled bladder acting as a ball valve over the vaginal orifice and in front of the cervix, it lay upon the anterior surface of the retroverted and prolapsed uterus. The resistance in front of the uterus being removed and the pressure behind being increased, the tendency to further stretching of the uterosacral ligaments was greater. The enormous burden was expended on the lower border of the broad ligaments and the rectovesical fascia. When the latter gave way, the base of the broad ligaments swung forward and the vagina prolapsed with the uterus. The process increased step by step until extrusion occurred.

The functions of the uterosacral ligaments, therefore, were to preserve the balance and to equalize the strain in front and behind the uterus, to hold the cervix and vagina upward and backward, maintaining the normal size of Douglas' pouch and to turn the body and fundus of the uterus forward in such a way that intraabdominal pressure was exerted upon its posterior surface with a tendency to antevert the organ. The mechanical principle was identical with that employed in the use of the pessary. No one now maintained the idea that the upper arm of the pessary held the uterus in place by making pressure upon the posterior wall of the uterus, but all agreed that its mechanical function was the one above mentioned, that is, to hold the vagina and neck of the uterus upward and backward, producing the effect above described.

The mechanical principles in surgical repair indicated a reversal of this process in addition to corrections of lesions of the cervix, vagina and floor of the pelvis. That is to say, turn the fundus forward and move the pivotal point posterior to the center of gravity of the uterus. This was best accomplished by shortening the uterosacral ligaments, reducing the size of Douglas' pouch and ligament suspension of the uterus. The former was done with continuous catgut sutures, closing the side and anterior surface of Douglas' pouch by infolding peritoneum upon itself behind the uterus until the pouch was reduced to normal. The next step, or shortening of the uterosacral ligaments he had simplified by putting into effect the single suture approximation of three points, one on the posterior surface of the cervix, the other two on either side of Douglas' pouch at the junction of the posterior and middle third of the uterosacral ligaments. If there was much elongation of ligaments, division of them into thirds would not place the suture at the proper point. In such instances it might be introduced above the middle of the posterior half of the ligament. In other words, a point should be selected far enough anterior to the sacrum to bring the two ligaments together in front of the rectum in such a way as to produce a normal-sized



retrouterine pouch. A long pair of forceps picked up the ligament at the point indicated, and brought it up as near the abdominal incision as it could be turned to facilitate manipulation. A heavy kangaroo suture in a stout curved needle was passed through the ligaments embracing quite a quantity of tissue. The ligament was then released, and the needle passed through the posterior wall of the cervix a little below the internal os. The other ligament was then picked up and the needle passed behind it as above described. In tying the suture, the three points were approximated at a common center. The effect was to reduce the size of Douglas' pouch and to pull the cervix uteri backward to its normal position. When there was much prolapsus of the uterus or excessive elongation of the uterosacral ligaments, tying the suture mentioned would cause the anterior part of these ligaments to fall into folds on either side of the cervix at the base of the broad ligament, and if the openings were large enough to admit the finger the folds should be gathered up and one turned over the other (behind the uterus), and each sutured to the opposite uterosacral ligament.

To prevent retroversion the body of the uterus was held forward by shortening the round ligaments. For this purpose he preferred an extraperitoneal operation, embedding the ligaments between the layers of the aponeurosis anterior to the recti muscles.

#### THE USE OF THE CONTINUOUS, FIXED LAPAROTOMY SPONGE.

DR. W. FRANCIS B. WAKEFIELD, San Francisco, California, stated that as the matter of sponges was usually handled in the average operating room, it was quite remarkable that loose sponges were not closed up in the abdominal cavity oftener than they were.

When Dr. Crossen, of St. Louis, wrote an article which appeared in the *AMER. JOUR. OBST.* for January, 1909, on "Abdominal Surgery without Detached Tags or Sponges," the speaker was deeply impressed with the practicability of his suggestions and immediately began to apply them. Since then—that is, for the last three years—he had entirely discarded the use of loose sponges from his abdominal work. He now used long folds of gauze of desirable size, which, for convenience and safety, were packed in bags. One end was stitched to the bottom of the bag, the other end was left free at the top. He had thus a continuous sponge which was pulled out little by little as required. Two sizes met all requirements.

It was a little difficult, at first, to become accustomed to the altered technic which the use of any new method involved, but one soon learned to use the continuous sponge rapidly and efficiently. He used a laparotomy sheet containing three pockets, one on either side, and one at the upper end of the opening in the sheet. In the upper pocket he fastened the bag containing the broader strip of gauze which was used for packing the intestines or walling

off local infective areas. In each side pocket he fastened one of the narrower strips which was used by the operator and his assistant for keeping the field clear of blood or doing any work a sponge might be called upon to do. The pockets in the laparotomy sheet were a good deal wider than the sponge bag, and the used-up part of the sponge was tucked away in the pocket of the sheet, leaving a clean portion of the strip always under the operator's fingers ready for use.

It was very important to keep the used-up part of the strip tucked away in the pocket, otherwise the sponge would be getting tangled up with everything around the field of operation. After using these continuous sponges a few times, this part of the technique became almost automatic. He rarely found it necessary, in an ordinary laparotomy, to use more than the three sponges with which he started. Should the operation be an unusually long one, however, or should hemorrhage be unusually troublesome, one was likely to require two additional sponges which were always in readiness.

Should an abscess be opened or any infective fluid be spilled in the abdomen or pelvis, one of the sponges was used to wipe it clear and then discarded, another pocket which contained sponges being pinned or clamped to the sheet over the original pocket, thus covering up the whole infected area.

When troublesome oozing occurred, which demanded the use of a temporary hot sponge pack, a sponge bag was pinned to the laparotomy sheet below the incision, and as much as was required was pulled out, wrung out of hot salt solution, and packed in the pelvis.

He was thoroughly satisfied with the use of these sponges. He found them easy to use, safe and economical. They could be used over and over again. Some of them they were using now were the original ones that were made three years ago. They were washed out after each operation, bleached, dried, repacked in their respective bags, and resterilized for use again.

A sufficient number of surgeons throughout the country had used the continuous laparotomy sponge a sufficient length of time to prove conclusively that abdominal operations could be efficiently performed without the use of the dangerous loose sponge. This being so, it follows logically that as time went on and the knowledge of this fact became more widespread, surgeons would find it increasingly difficult to obtain, in courts of law, extenuation for having left a sponge in the abdominal cavity.

Each set of sponges for abdominal section consisted of four narrow strips and one wide strip. Each narrow strip consisted of a piece of gauze 10 yards long and 12 yard wide, folded lengthwise so as to make six thicknesses. The strip when finished was 3 inches wide and 10 yards long with all the raw edges turned in and the ends stitched to keep it from unfolding. The strip was then ready for the bag which was made of very heavy muslin sewed with French seams (to prevent raveling), and when finished

was 5 inches wide and 10 inches deep. The bag was then turned inside out and one end of the strip sewn securely to the seam at the bottom of the bag. It was then turned right side out again and the strip was packed back and forth into the bag a little at a time, so that it would pull out easily when used. The bag was then closed with one strong safety pin, which was used later for fastening the sponge to the pocket of the laparotomy sheet.

The wide strip consisted of a piece of gauze 1 yard wide and 5 yards long, folded lengthwise, so as to make four thicknesses. When finished, it was 9 inches wide and 5 yards long with ends stitched the same as the narrow strips. The bag for the wide strip was 10 inches wide and 6 inches deep sewn with French seams. The strip was then fastened to the bottom of the bag and tacked into it and closed in the same way as the narrow strips.

Each laparotomy sheet was made with three pockets, one at each side 12 by 12 inches, and one at the head of the sheet 12 by 8 inches. At the beginning of an operation, one narrow strip was placed in each side pocket and pinned to the pocket with the safety pin which closed the bag containing the strip. The wide strip was placed in the pocket at the head of the sheet in the same way. The narrow strips were used dry, but the wide strip was dampened with hot salt solution before it was placed in the pocket.

Each set of abdominal section sponges had a separate set of pockets; and when fresh sponges were necessary the soiled sponges and pockets were covered with a fresh pocket containing a fresh sponge.

#### DISCUSSION.

DR. GEORGE GRAY WARD, New York City, said that for the past five years he had abandoned the use of separate sponges and had been using a continuous sponge in the form of a roller bandage, about 3 yards long and 6 inches wide, folded in four or five thicknesses of gauze. He got the idea from Dr. Polk, who had employed it for a number of years. In his service no loose sponges are used in the abdomen. This roller bandage is unrolled as it is required, and the ends of it are tucked underneath the flanks, held back by the intestines and clamped to the laparotomy sheet.

DR. I. S. STONE, Washington, D. C., stated there were quite a number of cases on record where foreign bodies had been left in the abdominal cavity after operation, and why was it not proper for an individual, who trusted the surgeon to operate upon him or her, to grant the surgeon a *carte blanche* to do what was best and the patient accept the responsibility. It was about time for surgeons to take a stand with regard to operating upon free patients and doing free work in hospitals, and then possibly be sued for twenty or fifty thousand dollars, if they were worth that much, as a result. The profession had done very little to protect itself against suits of this character. It would seem to him that



surgeons were at the mercy of the public, and especially of that class anxious to make the surgeon pay who had a good income.

DR. JOHN F. THOMPSON, Portland, Maine, said the essential thing, it seemed to him, was the count of whatever was used in the form of sponges. This was applied at the private hospital in Portland to everything practically which possibly went through the abdominal incision in the operating room, being counted by two nurses, and counted before and after. Sponges might by accident be left, and he insisted on the count as being essential.

DR. J. WESLEY BOVEE, Washington, D. C., said that this count of sponges was sometimes a miscount. Many a time he had closed the abdomen when the nurse was very much disturbed over the loss of a sponge. He had counted the sponges as he put them in, and he knew every sponge was out when the incision was closed, and it would be found a day or two later that the nurse had miscounted the sponges. This was not a reliable way. He had not tried the plan of the essayist, although it appealed to him. However, the plan he did follow was to have a tape attached to each sponge that went into the abdominal cavity. If one used five or six sponges in the abdomen with a tape on each, one coming out of the wound, the little strands of tape were clamped with one forceps, and he knew how many were put in and he knew when they came out. He would rather trust his own count than be responsible for the count of one or two nurses.

DR. BROOKS H. WELLS, New York City, stated that even the tape might go astray. In the only case he recalled in which a sponge was left inside the abdomen, the sponges were carefully counted before and after operation by a nurse, and they were all supposed to have tapes sewed on them with a weight on the end of the tape. The patient after a supravaginal hysterectomy, made a very good convalescence, and ten days thereafter she was brought into the clinic room, and shown to the students. He had been talking on this subject and had spoken of Dr. Crossen's method and of other ways of avoiding the possibility of having a sponge sewed up inside the abdomen. He introduced his finger into the patient's vagina and to his surprise found there a bulging culdesac and what felt like a mass of gauze. He held up his hand for silence, asked for a scissors, made a slit and removed a gauze pad. This was a case in which the sponge was left in spite of the fact that the sponges were supposed to have tapes on them, and were counted, and had weights on the tapes. In looking over a bundle of pads prepared by the same nurse, he found two sponges laid together and counted as one, one not having any tape attached to it.

DR. GEORGE H. NOBLE, of Atlanta, Georgia, said that sometimes in appendicitis cases he used a long strip of gauze, but when it came to the sponges he used one at a time, taking it out as soon as he put it in. There was a string attached to the sponge. This was the safest plan to follow in using sponges in the abdominal cavity.



DR. BENJAMIN R. SCHENCK, Detroit, Michigan, stated that the method they had followed at the Harper Hospital was to use large abdominal towels, using no sponges at all in abdominal operations. Some operators used gauze strips that were introduced into the abdomen, and these were numbered from one to eight, and the nurse must find every number. This was open to the same objection that Dr. Wells had referred to, namely, that two sponges might be put together. There was only one method, and this was the continuous attachment of the sponges such as Dr. Wakefield had described.

DR. CHARLES E. THOMSON, Scranton, Pennsylvania, by invitation, mentioned a case in which, according to the records, no sponge had been used. There was no occasion to use one as it was simply an exploration, and yet a sponge was found later in the abdomen. It was a case with very large fibroid of the uterus complicated with pregnancy. The woman was pregnant four months. Having made this diagnosis the incision was closed. To-day it was the greatest mystery as to how that sponge got into the abdomen. Later he performed Cesarean section in this case, removed the uterus and tumor, and the patient was well.

DR. FRANK T. ANDREWS, Chicago, said he used small sponges, which were carefully counted and carefully labeled with red marks. Sometimes he used a six-foot strip with a nickel ring attached to the end of a two-foot tape.

DR. BROOKE M. ANSPACH, Philadelphia, had followed Dr. Clark's custom in the University Hospital, that is, to do all isolating by means of gauze taken from a long roll, using two or three thicknesses. The roll was probably four or five feet long, so that there was only one piece used to pack off the intestines and isolate the operative area. Twelve sponges were used for exposed bleeding points, and these were carefully counted, but as soon as bleeding ceased they were removed.

#### GYMNASTICS AND OTHER MECHANICAL MEANS IN THE TREATMENT OF VISCERAL PROLAPSE AND ITS COMPLICATIONS.

DR. FRANKLIN H. MARTIN, Chicago, outlined a treatment for ptoses and their accompanying complications, by the employment of a systematic application of simple and well-known measures.

A comparison of the normal individual with the defective type, which was known to possess multiple visceral ptoses, markedly demonstrated that the defectives possessed general muscular inadequacy which (a) affected the contour of the abdominal cavity; (b) resulted in the chest becoming contracted by descent of the ribs, and (c) accounted for the defects of attitude in the standing individual; and finally explained many of the skeleton defects which he had learned to observe. An individual may have acquired weak muscles as the result of acute or chronic disease affecting every group of muscles mentioned and still

not possess ptosis. Such an individual would have to be constantly on the alert to avoid unconsciously adopting gradually the forward bend of relaxation. This, if not corrected by prompt return to normal nutrition, accompanied by suitable rest and intelligent endeavor to counteract the muscular tendency, would lead to an acquired ptosis. Too often this same condition was noticed among young girls and women even where there had been no acute or chronic crisis to account for the onset. It was gradually acquired by the individual indolently assuming too frequently the attitude of rest, without at any time giving the muscles of the body proper exercise. Fortunately in these days of wholesome athletics, we did not see so much of this.

These individuals, if not rescued in time, acquired a weakening of the respiratory muscles which inevitably led to a contracted chest, an inadequate diaphragm action, a contraction of the upper abdomen, a gradual descent of the upper abdominal viscera, digestive and nutritional disturbances, attenuation of the mesentery and ligament attachments from loss of fat, expansion of the lower abdomen from muscular weakening and visceral pressure, and finally to neurasthenia. This was practically the same picture that was presented in the definite congenital type in which was found the unblended mesenteries, the unfixed ascending and descending colons, the loose duodenum, the unascended kidney and undescended testicles.

Before any form of treatment of a hygienic character was attempted for general abdominal ptoses, careful analysis of the cases should be made to exclude complicating factors of the ptoses which would require preliminary surgical treatment, or if preliminary surgical treatment was necessary means should be instituted at once to utilize it. These complications included partial obstruction due to bends made permanent by adhesions, adhesions of viscera in disadvantageous positions due to intercurrent inflammation of some part of the abdomen and complicating tumors and permanent changes in the walls of the trunks.

The author divided the treatment as follows: first, posture; second, temporary supports; third, exercise of the muscles and correction of postural habits; fourth, fresh air and feeding.

The effect of posture on the viscera in the opened abdomen was demonstrated every time a patient was placed in the Trendelenburg position and the abdomen opened.

The most effectual and satisfactory preliminary abdominal bandage was the Achilles-Rose adhesive mole skin plaster placed upon the abdomen while the patient was in the Trendelenburg position after the viscera had been restored. If this was found to afford relief and severe symptoms did not follow its application in a short time which revealed adhesions of prolapsed viscera, a well-fitting canvas abdominal support or corset could be substituted for wear during the day. The essential thing in any abdominal support for the treatment of these cases was to have it uplift rather than compress the contents of the abdomen.

The exercises were of two varieties, those which were practised in connection with postural treatment in the Trendelenburg position, and those practised while wearing the abdominal support in the upright position.

The individual with the marked type of ptosis was required to arise from his bed each morning and assume a position on his back upon his extemporized Trendelenburg table, without a bandage. While in this position simple active muscular exercises were indulged in.

Frequently it was desirable to employ the influence of posture more particularly in prolapsed or retroverted uteri, where these organs were not permanently fixed by adhesions.

There were three influential factors that might be utilized in these cases in the gymnastic and postural treatment: 1. Replacement of the displaced uterus by the knee-chest posture; 2. ballooning the vagina and sometimes the rectum by distending them with air; and 3, aiding these two resulting by contracting and relaxing the abdominal muscles and the diaphragm.

Surgeons who had been looking for the complications of ptoses had found accompanying, if not directly depending upon general or partial ptoses, kinks or bends in the intestines which obviously had produced pathological stasis. These occurred particularly at the pylorus, the duodenojejunal junction, the terminal end of the ileum, the transverse colon and the sigmoid. Frequently the condition was made permanent by adhesions due to peritoneal inflammation caused by infection or excessive mechanical irritation of misplaced or overriding viscera.

By carefully exercising systematically and in turn the defective muscles of the trunk, and especially the strong muscles of respiration, the body form would gradually assume its normal shape; and where congenital defects of a serious character in the attachments of the viscera themselves were not present, gradually the individual would find that temporary abdominal supports might be eliminated as the muscle groups developed to their normal condition.

Too much importance could not be placed upon the deep expiration and inspiration action in developing the narrowed upper abdomen and the normal lower chest. This practice, which was reinforced by its effects in expanding the narrowed trunk from gravitation of the displaced viscera into the narrowed portion, also, he believed, was of marked benefit in relieving the passively congested viscera by gravity and the forced aspiration of their blood-vessels by the powerful action of the respiratory muscles.

#### DISCUSSION.

DR. W. FRANCIS B. WAKEFIELD, San Francisco, said he had been using a course of treatment for the last few years almost identical with that described by Dr. Martin, and the results had been extremely satisfactory. Surgeons were short-sighted if they allowed some of these women, who advertised physical



culture treatment in the popular lay journals, to treat this class of cases. One could take an intelligent nurse and train her to understand the principles of the application of such treatment and to make use of it intelligently, and it was better to take the necessary pains to do this and take these cases out of the hands of those outside of the profession and resort to a means of cure that would be found very useful in the profession.

DR. CHARLES P. NOBLE, Philadelphia, said that in these enteroptotic patients, the vitality was low. The treatment recommended by Dr. Martin gave them exercise, and enabled them to eat more, and therefore they developed more energy and were better. What they needed was rest. They should be fed abundant and wholesome food.

DR. CLEMENT CLEVELAND, New York City, said the posture the essayist spoke about was not the Trendelenburg, but merely an inclined posture, with the head downward. The Trendelenburg posture required relaxation not only of the abdominal muscles but of the psoas muscles. In order to get this, it was necessary to flex the thighs upon the pelvis with easy lifting, and the only table which did this was named after the speaker, and it had been in existence for years.

DR. RICHARD R. SMITH, Grand Rapids, Michigan, said that when these women came to the gynecologist they came in a great majority of cases in a state of fatigue. A woman who was enteroptotic and in a state of equilibrium, who was leading a life within her strength, did not suffer at all, but went about and did her work, and took her part in society with other women. She had a certain amount of vitality, but she gave out more easily. Then she consulted a gynecologist. The keynote of the situation was that she needed rest, both physical and mental. She needed to improve her nutrition, which meant better food, fresh air, or whatever other means we might employ. Mechanical measures would help incidentally, and if one could employ them in conjunction with the other things, surprising results might be obtained. The most difficult thing in connection with treatment was to get these women to follow the proper course.

He called attention to the preventive treatment of enteroptosis, and said if we followed these women back to childhood it would be found they were essentially of the same build when children as they were later in life; that the fundamental defects were found in childhood as they were found in adult life. These fundamental defects were a lack of nutrition, laxity of tissue, and a lack of vigorous development. They did not go on to full vigorous development that the normal individual did. If we were to handle this problem correctly we must prevent children from growing up into adult life in this imperfect state of nutrition, and this may be done if these children were taken up as a separate class of individuals and handled accordingly.

DR. WILLIAM S. STONE, New York City, said there were two specific details that had given him great satisfaction in connection



with the treatment of these cases. He found walking was one of the best forms of exercise. If the principles were carried out, it meant exercise and rest. A specific way of doing that was to tell these patients to take a walk and walk a little farther than they wanted to, and they should take the walk at such times so that when they reach home, without doing any work, physical or mental, they were to lie down on the bed or sofa for the same length of time that was consumed in taking the walk. They should be trained to carry out regular exercises, which should be immediately followed, after they get home, by rest. In addition to that, he relied in helping the circulation upon a good, brisk, careful rub.

DR. MARTIN, in closing the discussion, said the treatment he had outlined was developed in connection with the treatment of surgical cases, in the treatment of kinks of the ileum, in the transverse colon, and in conditions that were operated for by Lane and for which he gained a considerable reputation. The treatment would relieve the Lane kink that was produced by ptosis. There was no question about this. Each case was carefully separated, and the patient sent home convalescing and with instructions to go about. These cases he operated on afterward himself. He separated the adhesions, replaced the contents of the abdomen, and sent the patients out. Within a few months they returned with the kink still existing. In other words, the adhesions began to reform, and for some reason with relaxation or ptosis. They were half-made or half-baked individuals.

In regard to exercise, these individuals would not walk because they could not walk without pain and distress. The only time they were comfortable was when they were lying on the back or when in a reverse position. What he did for them, after operating upon them, was to put them in that position, after replacing the organs that were kinked and adherent. Instead of removing the colon or transplanting the ileum into the sigmoid, he put them in the Trendelenburg position and replaced the organs while they were in that position by filling them full with water, as was done by Clark, replacing the organs absolutely and he did not allow them to get out of that position for seventy-two hours.

*To be Concluded.*

## BRIEF OF CURRENT LITERATURE.

### OBSTETRICS.

**Operative Correction of Contracted Pelves.**—H. Rotter (*Zent. für Gyn.* March 30, 1912) proposes to achieve a permanent enlargement of the anteroposterior diameter of the pelvis by an operative reduction of the sacral promontory. This is proposed as a substitute for pubiotomy, which fails in securing such a permanent change in most cases. Rotter's procedure is as follows. With the patient in the Trendelenburg position, the abdominal cavity is opened by a low median incision and the sacral promontory exposed. The parietal peritoneum is incised longitudinally and the median sacral artery and the accompanying veins are tied off. The course of these vessels is readily exposed over the bodies of the last lumbar and first sacral vertebræ. A bone chisel about 3 cm. wide and slightly concave is then used to cut off a section of bone from 1 1/2 to 2 cm. thick from the anterior surface of the last lumbar and the upper portion of the first sacral vertebræ, including the portion of the intervertebral ligament between them. The soft parts are sutured over this wound and the abdominal cavity is closed. Rotter claims that the true conjugate may be increased from 1 1/2 to 2 cm. by this operation and considers that it is applicable in all those cases in which the contraction involves the true conjugate and the latter is not less than 7 cm. The operation is proposed as a prophylactic measure and is to be employed in only those cases in which the pelvic measurements have been carefully made and the patient has been subjected to the test of previous labors under careful observation. The author does not believe that the procedure is surrounded with any technical difficulties or that the removal of the sacral promontory interferes with the sustaining powers of the vertebral column, for the articular surface of the first sacral vertebræ has a diameter of at least 5.5 cm. Rotter considers that this operation will avoid the induction of premature labor, perforation, pubiotomy and Cesarean section. The procedure, however, has not as yet been tried on the living human subject, the author having carried it out merely on the cadaver and in animals.

**Biological Relations of the Fetal Cells.**—E. Rosenthal (*Gyn. Rund.*, 1912, No. 7) presents a contribution to the placental theory of eclampsia based on his personal researches, by which he endeavored to clear up the question of the behavior of fetal liver and placental cells in the presence of maternal and fetal blood serum. He submitted the material from his series of fetal livers and placenta to the action of blood serum from normal

women at various months of pregnancy and also the serum from the cord, all of these being controlled by tests with serum taken from nonpregnant individuals. In addition to these four cases of eclampsia were included. The results of these experiments have led Rosenthal to formulate the following conclusions. He believes that the serum of normal pregnant, as well as nonpregnant individuals contains cytolytic substances which have the ability to dissolve fetal cells. These substances are absent in the fetal serum from the cord. It also appears that in cases of eclampsia, an absence of this physiological solvent is observed after the attack. The cytolytic activity of the serum returns during convulsions to the normal; but in fatal cases continues to diminish. Rosenthal considers therefore that eclampsia depends on the absence of cytolytic substances which are present under normal physiological conditions. This insufficiency may be relative or absolute, or a combination of both.

**Tabes and the Puerperium.**—A. Fröhinsholz and André Remy (*Ann. d'obstet. et de gyn.*, March, 1912) say that the association of tabes and pregnancy is rare because tabes usually occurs after the age at which pregnancy is usual, because it is more frequent in men than in woman, and because sterility is generally present in the female victim of tabes. The percentage of sterility in tabes is 33 per cent., and this is explained by the action of the disease on the ovarian function and sexual instinct, and the age at which tabes occurs. The diagnosis of tabes is not always made in its early stage by the general practitioner who is generally called in by the pregnant woman, and some of the early symptoms of tabes, connected with the gastrointestinal system may easily be mistaken for the usual accompaniments of early pregnancy. While pregnancy has little effect on tabes, in some cases tabes causes lack of sensation of pain, and an easy labor ensues, the symptoms of tabes being increased after delivery. Tabes does not cause abortion, except as the syphilitic causation of tabes enters into the production of abortion. The authors have observed a case of pregnancy in which the diagnosis of tabes had not been made before the occurrence of labor, although the patient had had gastric crises, which had been considered due to pregnancy. She had no eye symptoms and no symptoms that could have been noted except by a careful neurological examination. When labor occurred she did not have any pain with the contractions, and when examined it was found that dilatation was already complete. Bearing down efforts could be excited only by the voluntary effort of the patient at the request of the physician. Delivery was normal and entirely painless, while her previous labors had been accompanied by much pain. These facts caused a neurological examination to be made, which showed the following facts: the Achilles and knee reflexes were abolished; walking in the dark was difficult; the patient feared to descend stairs and had fallen several times; Romberg's symptom was present. The



deep sensibility in the legs was lost, while the superficial was present. Sight was lessened, and there were mydriasis and inequality of the pupils, which did not react to light or accommodation. The lessened pain of labor contrasts with the presence of strong contractions, dependent on the fact that the motor power of the uterus is presided over by the sympathetic nerves of the lower spinal ganglia. The reflex arc is interrupted. At the same time painless labor is an exception in tabes. Heintz has shown that the uterovaginal anesthesia is correlative with that of the skin of the perineum and anterior surface of the thighs, due to lesions of the posterior roots of the third and fourth sacral nerves. The authors note that cases have been observed of false labor in tabetics, in which there were crises similar to gastric crises, which affected the uterus, causing the patient to believe that she was about to undergo labor.

**Thrombosis and Embolism in the Puerperium.**—Junge of Fehling's Clinic in Strassburg (*Arch. f. Gyn.*, Bd. xcvi, H. 2) has made a series of careful examinations in eighty-one cases out of 10,056 labors, in which thrombosis occurred and believes that the deciding factor in the production of puerperal thrombi resides in some damage to the endothelial lining of the vessel, in addition to the circulatory disturbance. These injuries to the endothelium were found in the varicosities in about 71 per cent. of multiparæ during middle life and were evident externally in 26 per cent. of all labors. This corresponds to the usual occurrence of puerperal thrombosis, which has been noted in about 74 per cent. of all multiparæ among which varices were plainly evident in 72 per cent. Involvement of the saphenous vein occurs most often in the first portion of the puerperium, that of the femoral vein in the later periods of the same and that of the pelvic veins in the intermediate period. Although both sites are equally involved, as a general thing, it seems as if thrombosis of the saphenous vein occurred more frequently on the right side and that of the crural veins on the left. Operative deliveries, hemorrhages, infections, severe constitutional diseases or prolongation of the second stage, predispose to thrombus formation, especially in multiparæ with varicose veins. Although such thrombosis may be preceded by slight elevation in temperature, there are no characteristic premonitory symptoms. Thromboses of the saphenous vein usually present a favorable prognosis, whereas if the deeply situated veins are involved, the condition is more doubtful, because of the danger though rare, of pulmonary embolism.

**X-ray Findings in the Differential Diagnosis of Early and Late Pregnancies.**—P. S. O'Donnell (*Jour. A. M. A.*, 1912, lviii, 748) says that by radiography the position of the fetus can be clearly determined from the fourth month, and this without danger to the fetus. He presents radiographs of a case reported by J. B. Murphy (*loc. cit.*) in which arrest of development of the upper extremities had occurred, with partial fibrous ankylosis of the



elbows. The radiograph was taken to account for the distance of the hands and feet from the head *in utero* and the inability to approximate them. The delivery was by the breech and the arms were delivered alongside of the head. J. B. De Lee (*loc. cit.*) says that in the diagnosis of pregnancy the *x-ray* will have a very limited field, because the cases are rare in which pregnancy could not be determined with the usual methods, by the time the *x-ray* is able to discover it. In fat women, or in cases in which the differential lies between pregnancy and large fibroid tumor of the uterus, the *x-ray* will be helpful. In cases of illegitimate pregnancy, where an abdominal examination is not permitted, or could not be suggested, the *x-ray* might discover the fetus. Extrauterine pregnancy could not be diagnosed as such, but a lithopedion could be discovered, although it might be impossible to say that it was not a calcified fibroid. The differential diagnosis between a normal pregnancy and hydatid mole, after the fifth month, could possibly be made by the *x-ray*. Twins should be easily discoverable after the sixth month. It might also be possible to diagnose gross fetal deformities, such as hydrocephalus and anencephalus, double monsters; and it is barely possible that an *x-ray* picture will become a necessity before every Cesarean section, the object being to certify that the child is well formed.

**Abdominal Pregnancy.**—A case of extreme interest is recorded by J. M. Calloway (*New Orleans Med. and Surg. Jour.*, 1912, lxiv, 641), an abdominal pregnancy with no sign of tubal rupture and terminated by operative delivery of a fully developed and living child. The patient, twenty-six years of age, had had two normal labors. She gave a history of hemorrhage from the uterus lasting about six weeks, seven and a half months before she was seen by the writer, and a whitish membranous discharge at intervals subsequently. Admitted as a case of ordinary pregnancy, she had nausea and abdominal pains a week or two later. The fetal head was palpated in the left hypochondriac region and a mass which proved to be the placenta in the right iliac. By vagina, the cervix was felt to the right and hands and feet to the left. As fetal movements and heart sounds were detected, operation was delayed for one month after admission. Incision of the abdominal wall revealed a fully developed child in a thin sac which ruptured when handled and contained little amniotic fluid and considerable meconium. The placenta was attached to the back of both broad ligaments and posterior surface of the uterus but not to other viscera. The uterus, tubes and ovaries, with adherent placenta were removed *en masse*. Tubes and ovaries showed no evidence of rupture. The child was saved and the mother's recovery was uneventful. The case is presented as one of primary abdominal pregnancy rather than of tubal abortion.

**Effect of Vaginal Douches in Pregnant Women.**—Esch and Schroeder of Zangemeister's Clinic (*Zcit. f. Geb. u. Gyn.*, Bd.

lxx, H. 1) have conducted an investigation for the purpose of determining whether the endogenous vaginal bacteria are influenced in a quantitative sense by vaginal douches during pregnancy and contrary to the generally accepted opinion as to the advisability of giving douches before labor, the authors believe as the result of careful bacteriological examinations that the subject demands fresh consideration. They bring forward the suggestion, therefore, that a douche be given at the beginning of labor especially before and not after a vaginal examination or operative procedures. They acknowledge, however, that if an inoculation has already taken place, the bacteria cannot be eliminated by douching and therefore this is of no use after such examinations. Repeated douches at intervals of about ten hours are also to be considered in cases of protracted labor. Care must always be taken in using this procedure and only a very slight degree of pressure employed so that none of the infectious material is transferred to the lower segment of the uterus. The authors have had the best results with sterile physiological salt solution as an irrigating fluid and a very dilute cresol solution has also been used in some of the cases.

**Pubiotomy in Face Presentation.**—A. H. Morse (*Surg., Gyn., Obst.*, 1912, xiv, 165) reports in detail a pubiotomy for delivery of a woman with generally contracted rachitic pelvis, the child lying in the right mento-posterior position. A small vesicovaginal fistula was the only unfavorable sequela and this closed spontaneously. Mother and child left the hospital in good condition. On discharge there was neither pain nor difficulty on locomotion. The pubiotomy wound was well healed. There was a definite depression over the anterior surface of the bone at the site of incision, and mobility of the severed bone ends could be made out on passive movements of the thigh. The writer has found records of only four other pubiotomies for face presentation, which he reviews. He concludes that in cases of face presentation, where the chin is directed anteriorly and the pelvis is normal, spontaneous delivery may be expected. Conversion is not indicated, since it means the substitution of an occiput posterior for the anterior chin, the former being hardly more favorable than the latter. On the other hand, if the pelvis be contracted and spontaneous delivery does not occur, while indications for terminating labor present themselves, the saw should be laid as for a pubiotomy, forceps applied and extraction attempted. If this is not possible, and the heart of the child is still in good condition, the bone should be sawed through and the child delivered. Where the chin is directed obliquely posterior, conversion should be attempted as soon as the condition of the cervix permits, thus substituting for the unfavorable mento-posterior a favorable occiput anterior position. If attempts at conversion prove futile, podalic version and extraction should be done as soon as the cervix becomes fully dilated; provided no contraindications are present. On the

other hand, if the head be so deeply wedged in the pelvis that conversion cannot be effected, while podalic version and extraction are ruled out, the head should be allowed to advance, with the hope that on reaching the pelvic floor anterior rotation may occur. If this fails and delivery is indicated, the saw should be placed as for a pubiotomy, forceps applied to the sides of the head, according to Scanzoni, and anterior rotation attempted. If it be impossible to turn the head or to cause descent, the bone should be cut through, when anterior rotation may be effected and the child extracted in a mento-anterior position. If the chin be directly in the hollow of the sacrum, attempts at conversion are urgently indicated; and if these fail, podalic version with extraction as soon as the condition of the cervix permits. But if the face be so firmly fixed that conversion and podalic version are ruled out, primary pubiotomy should be done, the head converted into an occiput anterior or not, as the case may indicate, and the child extracted with forceps. Pubiotomy should replace craniotomy in all face presentations, except where the child is already dead, or in so precarious a condition as to preclude a radical operation. The rate and regularity of the fetal heart should be carefully noted just before operation is begun, and should be sufficiently satisfactory to ensure a living child as the result of the operation. The operation is contraindicated in face presentations where the conjugata vera measures 7.5 cm. or less, or when the woman presents signs of infection or previous attempts at delivery have been made by those whose aseptic technic is open to question. Pubiotomy should be regarded as an operation to be undertaken solely for the benefit of the child. Accordingly, it should be limited to cases in which there is a reasonable expectation of obtaining living offspring.

**Ammonia Coefficient in Severe Vomiting of Pregnancy.**—It was contended by Williams ~~in 1906~~ on the strength of four cases of severe vomiting in pregnancy, that, whenever the amount of ammonia in the urine of such cases amounts to more than 10 per cent. of the whole nitrogen excreted, the pregnancy should be artificially terminated. A. W. M. Ellis (*Can. Med. Assoc. Jour.*, 1912, ii, 108) holds that this doctrine should be abandoned, basing his opinion upon his findings in a case in which the coefficient varied between 20.5 and 37.5 for several days, with subsequent complete recovery and labor at term. At a time when the coefficient was still 36.3, the patient was obviously very much better and was able to retain increasing quantities of food. Even so, she was of course receiving far short of the physiological amount of energy in her food, and therefore the high ammonia coefficients would appear to have been determined rather by this fact than by any such toxemia as that inferred by Williams to exist in all such cases.

**Treatment of Puerperal Septicemia by Bacterial Vaccines.**—A preliminary report by G. T. Western (*Proc. Roy. Soc. Med.*, 1912, v, Obst. and Gyn. Sect., p. 214) on the vaccine treatment



of puerperal septicemia has been supplemented by a study of 100 cases, fifty-six of which were treated in this way. The writer's analysis of these cases shows that the mortality among those cases of puerperal septicemia in which there is definite bacteriological evidence of bacteria in the blood-stream is from 85 to 95 per cent. This mortality may by inoculation with autogenous vaccines be reduced to about 55 per cent. The mortality among notified cases of puerperal fever is about 60 per cent. This mortality may by inoculation with appropriate vaccines be reduced to about 33 per cent. In cases of puerperal sepsis, if it is decided to explore the uterine cavity the opportunity of obtaining a culture at the same time should not be lost. In the treatment of puerperal sepsis "stock" vaccines give inferior results, and should only be used when an autogenous vaccine cannot be obtained.

**Cultures of Lactic Acid Bacilli in Puerperal Infection.**—A. Brindeau (*Arch. mens. d'obst. et de gyn.*, March, 1912) has found the use of cultures of the lactic acid bacillus of great use in various gynecological complaints involving disagreeable discharges and inflammatory conditions. He has treated by this method ninety-two cases in all, of which fourteen were endometritis, forty-eight septic vulvovaginal wounds, thirteen abscess of the breast, six various forms of postoperative conditions, two puerperal peritonitis, and the others various septic conditions. In endometritis it simply lessened fetidity of the lochia. In diphtheritic wounds it acted marvellously well, causing the membranes to disappear, and the wound to clean and heal rapidly. In abscess of the breast which had been incised, but did not drain or heal well, it acted excellently, and healing progressed rapidly. Ununited wounds healed well under the cultures. In puerperal peritonitis, one case was cured while it failed in the other. The action of these cultures is to deodorize and to destroy other bacteria. This it does both by the acidity produced and by the leucocytosis which it causes. It is in no way dangerous or harmful in obstetrics. The author concludes that the cultures of lactic acid bacilli act as an efficient, nontoxic antiseptic. They prevent some pathogenic species of germs from growing and cause increased leucocytosis. They may be employed in all septic and putrid wounds, but especially in infected vulvovaginal wounds secondary to labor. Such wounds lose their inflammation rapidly, and the use of such cultures is an excellent preparation for restoration of the perineum.

**Septic Thrombi.**—Duffek (*Arch. f. Gyn.*, Bd. xcvi, H. 2) has examined thrombotic femoral veins from cases of erysipelas, prolonged postpartum parametritis, pyemia following a streptococcic infection of the skin and four cases of septic metritis after labor. A considerable number of animal experiments were also made for the purpose of determining in what manner infection of thrombi results. The septic thrombi from the human subjects which were examined showed a well marked coral-like structure



made up of blood platelets, and the nucleus of this was covered with leucocytes and layers of fibrin. Bacteria were only found in the thrombi of this type. The structure of these thrombi and the localization of the microorganisms seemed to show that the latter only became involved during the formation of this structure. Under normal conditions, the veins of the placental site became closed with coagulation thrombi and rarely with the other type. In the absence of puerperal infection, the thrombi already formed became infected secondarily. It was not possible in the animal experiments to produce septic thrombi by experimental infection of the nonpregnant, pregnant or puerperal uterus.

**Treatment of Infected Abortions.**—Häberle (*Münch. med. Wochenschr.*, April 2, 1912) presents the results of his observations in a series of ninety-eight cases from Hofmeier's Clinic in Würzburg. This series includes all cases in which fever was present before treatment was begun or in which decomposition of the secundines resulted. All the infected cases were included in the first half of pregnancy. Among the ninety-eight cases treated by radical means there were five deaths (5 per cent.), and in the remaining ninety-three cases, postoperative complications developed in three, including a pyosalpinx, a slight perimetritic exudate and a slight thrombophlebitis. In one-half of the total number of cases the temperature came down after the uterus was emptied and remained so. In thirty-one cases, the temperature dropped to the normal from one to three days. In eleven cases, a slight fever lasted from four to eight days and in three it persisted longer, although without any severe general symptoms. The clinical results in this series of cases seem to support the principle of active therapeutic interference in this condition. In one of the fatal cases, the curetage was preceded by numerous examinations before admission to the hospital, in the second, attempts had been made at cleaning out the uterus by a midwife, in the third, a protracted placenta previa abortion with severe anemia was present, in a fourth, there were evidences of a criminal abortion and in the fifth, cardiac weakness developed soon after the operation. The author used a forceps or a dull curet in all the cases followed by irrigation with lysol solution and the application of a 20 per cent. carbolic solution in alcohol.

**Dystocia Due to a Vaginal Cyst.**—F. Fischer (*Monatsschr. f. Geb. u. Gyn.*, April, 1912) reports a case in a iii-paræ with previous normal labors, in which a large cyst on the posterior vaginal wall constituted an actual obstruction to delivery. It was impossible to bring the head past the tumor, even with the aid of forceps and during the traction efforts the growth was spontaneously extruded in front of the head. The tumor measured 39 cm. in circumference and weighed 382 grams. It was tense and filled with a thick, viscid fluid and the walls were considerably thickened. The patient made a good recovery in other respects.

**Treatment of Ovarian Cysts Which Present in Front of a Pregnant Uterus.**—M. Lepage (*Bull. de la Soc. d'obst. et de gyn.*,

*de Paris*, March, 1912) cites a case in which a small ovarian cyst was so placed below the pregnant cervix that, labor coming on, it was found impossible to deliver without lessening the size of the cyst. The author removed the fluid from the cyst with a fine aspirating needle, and delivery was effected naturally. When the patient recovered from her confinement no trace of the cyst was to be found. In general, obstetricians state that an ovarian cyst when obstructing labor should be removed by laparotomy; but Lepage has shown that the condition may be successfully relieved by simple puncture, and thinks that there are indications for such a procedure.

**Action of Hypophyseal Extract in Labor.**—W. Benthin (*Zeitschr. f. Geb. u. Gyn.*, Bd. lxx, H. 1) presents the results of an investigation in forty cases, with a view to the making of a differential diagnosis between the false and true pains of labor. The writer found that if given during labor a prompt oxytocic action results, but aside from this the substance is also of value in making a differential diagnosis between the ordinary labor pains in the later months of pregnancy and those of labor itself. Where the pains are induced after the administration, they gradually diminish, even when the pituitrin has been continued. Finally, it is not possible to stimulate the uterus to further contractions with renewed doses and this organ remains refractory. In the presence of weak or diminished true labor pains, however, even small doses are sufficient to stimulate continuous contractions. The reflex abdominal contractions during the expulsive stage of labor, are also favorably influenced by the drug. On the other hand, the author is firmly convinced that the induction of labor is successful only in exceptional cases.

**Extract of the Hypophysis in Obstetrics.**—A. Spire and J. Parisot (*Jour. de méd. de Paris*, May 11, 1912) say that the extract of the hypophysis has an action on the contraction of unstripped muscular fibers that should be studied. In women in labor who cannot urinate it has been found to cause natural urination. It causes contraction of the unstripped muscular fibers of the blood-vessels, and raises arterial pressure in the thyroid, uterus, and tubes. The extract of the posterior portion of the gland causes more marked contraction than that of the entire gland. It stimulates the atonic uterus postpartum and lessens hemorrhage, while it hastens the expulsion of the placenta. It is of interest to observe whether pituitrin can cause contractions when labor has not yet commenced. It is harmless when administered either subcutaneously, or intramuscularly. Still it should be used with some care when the kidneys are unsound.

**Laceration of the Umbilical Vein.**—H. Edelberg (*Monatsschr. f. Geb. u. Gyn.*, April, 1912) refers to the comparative frequency of lacerations of the umbilical vessels in the new-born, with the likelihood of a fatal result. In the present instance the case described showed a rupture of the umbilical vein within the abdomen and is apparently the only case of this kind reported.

The infant was born as the result of a normal labor and immediately afterward was observed to be very pale and died an hour after birth. An autopsy showed the abdomen full of fluid blood and a tear of the umbilical vein where this structure passed into the liver. The vein itself, was considerably dilated beyond the normal although sections of the wall did not show any variations from the normal structure. There were no inflammatory changes present and the rupture was probably due to the traumatism brought about by a congestion in the abnormally distended and thinned-out vessel.

**Hemorrhage During Labor from Rupture of an Aneurism of the Splenic Artery.**—W. Wesenberg (*Zent. f. Gyn.*, April 13, 1912) reports an instance of this rare condition, of which only five cases have thus far been described. The patient was a iv-para, with a history of three previous normal labors and a complaint of gastric disturbances during her present pregnancy. About one month before term she was suddenly seized with severe pains in the abdomen and back and when admitted to the hospital, the examination of the very anemic patient, pointed to the possibility of a concealed hemorrhage from premature separation of the normally situated placenta. The cervix admitted one finger and as the pains were slight, dilatation by means of rubber bags was decided on. No fetal heart sounds or movements were present before labor. The labor proceeded spontaneously and was not accompanied by any excessive hemorrhage. Although the condition seemed satisfactory, the pulse remained high and ten minutes after the delivery of the placenta, the patient went into a sudden collapse and died. An autopsy showed the presence of about two quarts of free blood in the peritoneal cavity and a search revealed a ruptured aneurism of the splenic artery, situated at the hilus. There was also a hydronephrosis present on both sides. Although a number of cases have been reported in which hemorrhage from a ruptured spleen occurred, the rupture of the splenic artery seems to be very unusual.

**The Wassermann Reaction in the Pregnant Woman in the Florid Stage of Syphilis.**—R. Daunay (*Arch. mens. d'obst. et de gyn.*, April, 1912) after referring to a previously published memoir, gives the results of recent researches in the value of the Wassermann reaction for syphilis in pregnant women, in the florid stage of the disease. He has examined 146 new cases of syphilis and thirty-four infants, with reference to the blood serum and the breast milk. These women he divides into four categories: First, women about to be confined, who presented syphilitic lesions which left no doubt of the diagnosis; second, women in whom there had been lesions, which had left their mark; third, those who were suspected of past lesions; fourth, women who had had no suspected lesion. In the first category it was found that the lactoplasma could be used for tests when there were difficulties in obtaining blood serum, and equally valuable results could be obtained with the test fluid. Absence of positive results in such



cases may be due to the method of penetration of the virus of syphilis, an anomaly in the activity of the specific antibodies, or a true inactivity of the antibodies. In women in the florid state of syphilis the antibodies may pass into the milk, and there is always parallelism between the reactions of the milk and the serum. When salvarsan is used in florid cases it at first causes the Wassermann reaction to be increased, and later to become negative. In women treated with salvarsan in whom the milk was tested, fifteen days after the injection there was an absence of antibodies in the milk; these bodies may increase in the milk as they increase in the serum but slightly. Thus, salvarsan acts directly on the hemolytic system and prevents hemolysis partially; at first the reaction becomes negative, then after several injections may become positive again. The biological phenomenon of the passage of antibodies into the milk is an established fact, and after administration of salvarsan there is a passing increase of these antibodies in the milk; this phenomenon is inconstant. The amount of arsenic that passes into the milk is negligible. These facts account for the failures in this method of treatment of infants. In the group of women suspected of syphilitic lesions the results show the value of a systematic test of all suspected cases with the Wassermann reaction, in pregnant women, those who have aborted, those having macerated fetuses, and those suspected for other reasons. In fifteen women who appeared normal at the time of test the reaction was negative. In the thirty-four children tested there was generally a uniformity between the results of serum examination in mother and child in the florid stage of syphilis. Women in the florid stage may give birth to children apparently normal at the time of birth, and yet giving a positive or partially positive reaction. Women giving only a partial Wassermann reaction may give birth to infants with severe syphilitic lesions and a positive reaction, or to children without clinical signs of syphilis, but with a positive reaction. Mothers without lesions and with a negative reaction may give birth to children with no signs of syphilis, but with a positive reaction. In cases in which the mothers are simply suspected, the children may have florid syphilis and positive reaction or no trace of syphilis and a negative reaction. Women suspected and yet giving a negative reaction, may have children with florid syphilis and a positive reaction.

**Rupture of the Vault of the Vagina during Labor.**—Jules Rouvier (*Ann. de gyn. et d'obst.*, April, 1912) says that rupture of the vault of the vagina during instrumental labor is a rather rare complication since the use of ergot during the second stage of labor has been discontinued. At the present time it is due to ignorance or maladroitness of accoucheurs, and midwives. It occurs during the application of the forceps, version, and other forms of artificial delivery. Instruments may be badly introduced, in the wrong direction, or the walls of the canal may be grasped instead of the fetal head. The existence of cicatrices



which have resulted from previous deliveries may be a predisposing cause of the accident. When retraction of Bandl's ring occurs the uterus is pushed upward by the fetal mass, and the head lodges in the smaller portion of the inferior segment, unduly stretching it and causing it to rupture, and the vagina is torn at the same time. The movements of a woman partially under the influence of the anesthetic may cause instruments to deviate from the expected direction. Forceps are more often responsible for ruptures than other instruments. Embryotomes badly managed may perforate the uterus and tear the vagina. Any serious obstacle to the engagement of the fetal head may cause rupture of uterus and vagina by the uterine contractions. These contractions cause the upper portion of the uterine walls to thicken, while the inferior segment becomes thinned. Anything which prevents normal dilatation of the cervix, such as cicatricial contraction, may cause rupture of the cervix and vagina. Whenever the diameters of the fetus do not correspond with those of the pelvis, uterine contraction is irregular and rupture may occur. All sorts of irregular presentations are etiological factors. Anteversion of the gravid uterus, pelvic contractions, atresia of the vagina, congenital or acquired, and general or localized, are maternal causes. The tear may be a simple perforation, a long rent, or a disinsertion of the vagina. If the anterior culdesac is involved the bladder will be torn. The symptoms are pain, hemorrhage, shock, migration of the fetus into the abdomen, or hernia of the intestines. Labor is interfered with only when the uterus also is ruptured. The rupture generally results, however, in the death of the fetus, due to the difficulties of extraction, which are increased by the tear. For the mother the prognosis becomes very grave. Death may come soon as a result of hemorrhage, or later as a consequence of sepsis. Prevention of such ruptures is the first object for the accoucheur, and this will be attained by better education of the midwife, and physician, frequent and proper examination, and early diagnosis of such complications as atresia and pelvic contractions. The public must be educated as to the possible dangers to the woman, and the necessity for trained care even in simple cases. If the tear is recognized before delivery labor should be expedited as rapidly as possible. Laparotomy or the Cesarean section is generally demanded. If the fetus is dead its destruction may be an assistance to delivery. After delivery a careful examination of the vaginal culdesac should always be made if there has been a difficult extraction. In many cases the wound may be sutured, but if rupture is complete, laparotomy must be done, and the uterus removed *in toto*.

**Cholera and Pregnancy.**—F. Pezzini and R. Pirani (*Ann. di ostet. e gin.*, April 30, 1912) gives the results obtained from the observation of twenty-seven cases of pregnancy in women afflicted with cholera in Livorno. He concludes that the pregnant woman is rather more liable to an attack of cholera than those not preg-

nant. The prognosis of cholera is not modified by pregnancy, and the prognosis for the woman is worse as she is nearer the end of gestation. The tendency to interruption of pregnancy increases with the advance of the pregnancy. The fetal prognosis is very bad; the later in pregnancy the cholera occurs the greater is the possibility of the survival of the fetus. In women who survive the disease and the interruption of pregnancy, the puerperium is normal. In women who recover without having undergone delivery pregnancy goes on regularly.

#### GYNECOLOGY AND ABDOMINAL SURGERY.

**Accidents in Radiotherapy of Uterine Fibroids.**—Réné Désplats (*Jour. des sci. méd. de Lille*, April 6, 1912) calls the attention of operators to an accident that is liable to take place in the treatment of uterine fibroids with radiotherapy. This is a deep ulceration of the skin of the abdomen, occurring in fat women with thick abdominal walls, in whom the nutrition of the parts is deficient. These deep ulcerations are very slow to heal.

He thinks that we should limit the use of this treatment to women near the menopause, because the function of the ovaries returns to the normal after a time and the treatment has to be repeated in young women.

**Position as a Factor in Drainage of the Peritoneal Cavity.**—Experiments with the cadaver by W. Conglilin (*Jour. A. M. A.*, 1912, lviii, 679) showed that the pelvic cavity could not be completely drained of water by raising the supine body even to ninety degrees "bolt upright." It could be completely emptied of water by turning the horizontally placed body just more than mid-way between pronation and supination. Water found its way from the left loin to an exit just below and internal to the right anterior superior iliac spine with the body raised to forty-five degrees in the right lateral position. With a distended condition of the intestines, although water gravitated less readily, practically the same results were obtained. Water did not so easily find its way from the right loin to exit just below and internal to the left anterior superior iliac spine; no matter how high the left laterally lying body was raised a quantity remained in the right loin.

**Treatment of Miscarriage.**—E. B. Young and J. T. Williams (*Boston Med. & Surg. Jour.*, 1912, clxvi, 364) present an analysis of the results obtained by different methods of treatment in 2000 cases. They find that salpingitis has been more common after intrauterine douches. Intrauterine douches of sterile water or salt solution have not given as good results as simply wiping the uterine cavity with sterile gauze. Antiseptic douches have given poorer results than simple sterile solutions. Swabbing the uterine cavity with tincture of iodine has given the best results. Packing the uterus to control hemorrhage does not greatly increase the liability to infection. For packing, gauze saturated

with 50 per cent. alcohol in "clean" and plain sterile gauze in "infected" cases have given the most satisfactory results.

**Lateral Hematocolpos in Double Uterus and Vagina.**—Vautrin (*Bull. de la Soc. d'obst. et de gyn. de Paris*, March 3, 1912) considers the subject of the occasional occurrence of double uterus and vagina, one vagina having no exit. In such cases there may be an accumulation of menstrual fluid in the closed vagina, which becomes infected and forms a hematopyocolpos. The author relates the history of such a case operated on by him. In duplex uterus if the vagina is double and both have a patent exit there is no damming up of the menstrual fluid, but when the second vagina is rudimentary, or has no exit there is a periodic congestion in this closed tube, with a collection of fluid, and sooner or later this fluid is sure to become infected. When this occurs and the double condition is discovered it is necessary to do some operation to prevent the recurrence of the condition. If we simply open the vagina and drain it the opening generally closes and the condition repeats itself. If we amputate one uterus and leave the cervix we still have the congestion in the cervix remaining behind, and the secretion collects at the congestive periods. The best operation is removal of the entire second uterus and vagina whenever possible, leaving the single uterus in condition to functionate.

**Treatment of Cancer of the Uterus with the Actual Cautery.**—Total hysterectomy, says J. F. Percy (*Jour. A. M. A.*, 1912, lviii, 696), is an operation beyond the skill of the average surgeon. Cauterization gives no primary mortality, an appreciable number of symptomatic cures, and at least a largely increased percentage of lives greatly prolonged in comfort, with freedom from hemorrhage, exhausting and offensive discharge, and mental distress. For its performance the abdomen is prepared as for any abdominal section. The patient is put in full Trendelenburg position. An abdominal incision is made just sufficient to admit one or two fingers of an assistant into the pelvis; in the thin patient, one finger is enough. This finger determines roughly the degree of heat coming into the pelvis and the proximity of the cautery head to important structures. A thermometer indexed to register at least 250° F. is introduced through the urethra into the bladder after the urine is removed by catheter. A second similar thermometer should be in readiness for use in the rectum, if it is found necessary to cauterize deeply posteriorly. The fingers can be used here also. The cautery is applied in the vagina through a Ferguson speculum, made on the plan of a vacuum bottle.

**Specific Diagnosis of Gonorrhea in the Female.**—Van de Velde (*Monatsschr. f. Geb. u. Gyn.*, April, 1912) claims that modern conditions demand that the clinical diagnosis of gonorrhea in the female based on symptoms alone, is no longer permissible and even the ordinary bacteriological examinations frequently fail to afford a positive diagnosis. Greater attention should therefore be given to the specific methods in these cases and Van de Velde



believes that a diagnostic culture should be regularly made. For the purposes of obtaining the true culture he considers the ascites-agar medium the most suitable as regards the immunity reaction. Repeated finding of a low opsonic index is a symptom which undoubtedly points to gonorrhea, whereas a normal opsonic index does not mean anything. The Wright method he considers the most reliable but care should be taken in interpreting the results. The laboratory must support the clinical history and should not dictate the diagnosis or the treatment of the disease. A diagnostic vaccination sometimes brings about increased secretion in which the gonococci are much more numerous and easily found, even where they could not be previously determined. Inflammatory adnexal tumors show increased swelling and tenderness during the negative phase after vaccination, if they are gonorrheal in character. Recent adnexal inflammations are not susceptible to methods of diagnostic vaccination. Small initial doses must be employed and care taken not to overdose and endanger the patient. The results must be controlled by opsonic tests in order to determine whether a sufficient negative phase has resulted. Only when this is the case may the vaccine be regarded as of diagnostic significance and then even the negative results which are obtained by these methods are of value.

**Vaccine Treatment of Gonorrhea in the Female.**—Slingenberg, of Treub's clinic in Amsterdam (*Arch. f. Gyn.*, Bd. xcvi, H. 2), has used this method of treatment in a series of cases of vulvovaginitis, in both children and adults and also in a number of chronic adnexal tumors. In the children, the dose varied between 500,000 and 2,500,000 bacteria, used at intervals of from five to nine days. In addition to this, protargol bougies were introduced into the vagina two or three times weekly. Local treatment was employed because it is believed that the antibacterial substances are unable to reach the gonococci present on the surface of the mucous membrane. In order to avoid any confusion, a number of cases were also treated without any local measures, with the result that any purulent discharge present, disappeared for the time being. In other cases treated locally without results, the addition of the vaccine treatment was most effective. As regards vaccination in the vulvovaginitis of adults, no definite conclusions were arrived at, although in one of the cases of long standing an improvement was apparently secured. In the cases presenting chronic inflammations of the adnexa, the results were uniformly good, both objectively and subjectively. A great advantage of the treatment is that most of the cases can be treated without rest in bed. The writer calls attention, however, to care necessary in giving the first injection, as the negative phase may be very unpleasant, therefore, the initial dose should not be over 10,000,000 bacteria. At the same time, the injections are also of value for diagnostic purposes, for if increasing doses do not produce any rise in the temperature, or subjective or objective symptoms, the diagnosis of gonorrhea may be ruled out.



**Local Application of Sugar in Gynecology and Obstetrics.**—F. Kuhn (*Zeitschr. f. Geb. u. Gyn.*, Bd. lxx, H. 1), publishes certain views as to the biological treatment of vaginitis and puerperal fever with sugar, which he considers has a marked antiseptic action in this locality. For the purpose of his investigations, he examined the acidity of the vaginal secretions under the influence of various carbohydrates in a series of patients afflicted with gynecological conditions. He likewise studied the effect of sugar as a local application in the puerperium. As the result of his observations, he presents the following conclusions.

The lactic acid content of the vagina, which is well marked in physiological conditions, is diminished in pathological states and this undoubtedly plays a part in the prevention of puerperal fever. The application of sugar in the vagina readily increases this lactic acid to a marked degree. As sugar may be readily introduced in a concentrated form, the lactic acid content may be permanently increased by this means. Lactic acid may be produced from grape sugar and other carbohydrates by bacterial influences from the normal or pathological germs of the genital passages. The disintegration of the sugar does not produce any harmful or unpleasant by-products. The lactic acid relations in the vagina must be regarded as a biological condition and acid ferments which result from the disintegration of sugar in this locality bring about a reduction and often a destruction of the streptococci and other germs. The sugar and lactic acid also exert a favorable effect on the mucous membrane and may be regarded as remedial measures in many vaginal conditions. The author claims, as the result of his observations, that diabetic patients are more apt to be protected from puerperal infection than other women. He believes, moreover, that the application of sugar in the upper parts of the birth canal exert a prophylactic action after labor and also in beginning puerperal infection and must be regarded as a therapeutic possibility. As the genital passages are bathed with a continuous stream of sugar and acid solutions, the alkaline disintegration which often occurs, is prevented and in this way infection is guarded against and perhaps cured.

**Results of Vaginal Operations in Retrodeviations of the Uterus.**—Weibel (*Zeitschr. f. Geb. u. Gyn.*, Bd. lxx, H. 1) presents the post-operative results in a series of 300 cases operated on in Wertheim's clinic in Vienna by the vaginal route. It was possible to examine, however, only 162 of these cases, of which forty-two had been operated upon by the simple folding of the round ligaments according to Wertheim's method, ninety-one by suturing the shortened ligaments to the vagina, twelve by vaginofixation of the uterus and seventeen by shortening and fixation of the round ligaments combined with vaginofixation. Among this total number there were 18.5 per cent. of recurrences, of which the ordinary shortening included 16.7 per cent., in contrast to the 44 per cent. of recurrences according to Schauta's method of

operating. As regards the subjective recurrences, 15 per cent. of the women complained of a return of symptoms, which leaves a small percentage in which the symptoms had disappeared, although the anatomical malposition had returned in part. In seventeen of the cases, eighteen pregnancies resulted, all of which ran an uneventful course and in only two of these did a recurrence of the uterine displacement result. The operation by the vaginal route is properly indicated in the cases where the uterus is moveable and from an experience with such a large series of cases the statement seems proper that a radical operation should be done in the presence of any complicating adnexal affections where a complete removal would seem more appropriate. In other words, it is not a question of which method of fixation is the best but which mode of treatment will have the best effect on the chronic perimetritis and the adnexal conditions.

**Path of Infection in Genital Tuberculosis.**—Bauereisen (*Arch. f. Gyn.*, Bd. xcvi, H. 2) presents the results of an extended series of animal experiments in which a method was employed similar to that used by the same investigator in tracing an ascending tuberculosis of the urinary organs. Guinea pigs were used for the intravaginal inoculations, as the relations of the parts seemed more suitable for observation than in rabbits or other animals. Bauereisen used virulent cultures of the bovine tubercle bacillus and found that if the inoculated material was sufficiently virulent, a vaginal tuberculosis resulted in the presence of even microscopic lesions of the mucous membrane of the vagina. This experimental primary vaginal tuberculosis became disseminated through the lymphatics into the sections of the vaginal tract higher up, as well as in the tissue of the broad ligament. In addition to this, an intracanalicular ascending infection from the tubercle or the flow of the secretions was inhibited because of physiological or pathological conditions. The contractions of the genital tube favored the distribution of the tubercle bacilli within the canal. Where the genital tract is normal, the author failed to observe any spontaneous intracanalicular ascension of the tubercle bacilli. A primary tuberculosis of the uterus produced by experimental means becomes disseminated downward along the canal and also intramurally through the lymphatic channels to the deeper segments of the genital organs. In cases where the genital tuberculosis developed sufficiently, the virus gradually invades the walls of the neighboring organs through the lymphatic channels. A tuberculosis of the renal cortex may also be produced by a lymphatic invasion from the tubercular capsule of the kidney, as well as the aortic lymphatic glands.

# DEPARTMENT OF PEDIATRICS.

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## ORIGINAL COMMUNICATIONS.

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### THE DIAGNOSIS OF FRACTURES ABOUT THE ELBOW-JOINT IN CHILDREN.\*

BY

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(With eight illustrations.)

NOTWITHSTANDING the fact that the roentgenologists have for years been making good radiographs of the elbow, many of the surgeons, and some of the roentgenologists make no distinction in the classification of fractures about the elbow in children and adults, except in the case of separation of the epiphysis of the humerus. Scudder, in his work on fractures, has a number of radiograms of supracondylar fracture, which he calls epiphyseal separations. Warbasse, in an illustrated article in the *Medical Record*, Jan., 1909, has fallen into the same error. Ashhurst, in a monograph on fractures of the lower end of the humerus, for which he received the Samuel D. Gross prize, publishes a number of radiograms of supposed epiphyseal separations. All of these which are clear enough to be interpreted show some other lesion.

The ends of the bones entering into the formation of the elbow-joint are at birth entirely cartilaginous. About the end of the first year a center of ossification appears in the external condyle. This center grows in all directions but somewhat more laterally than vertically. About six years of age, centers appear in the head of radius and the epitrochlea. Frequently there are two centers for the olecranon. In the twelfth year appears a center for the epicondyle. By the sixteenth or seventeenth year most of the epiphyseal lines have disappeared and the bones are completely ossified. This paper concerns fractures in children

\* Read before the Brooklyn Medical Society, December, 1912.

under twelve years of age, as after that time ossification is so far advanced that the lesions in children are similar to those in adults.

The fractures of the lower end of the humerus in children are:

1. Supracondylar.
2. Diacondylar, or low supracondylar.

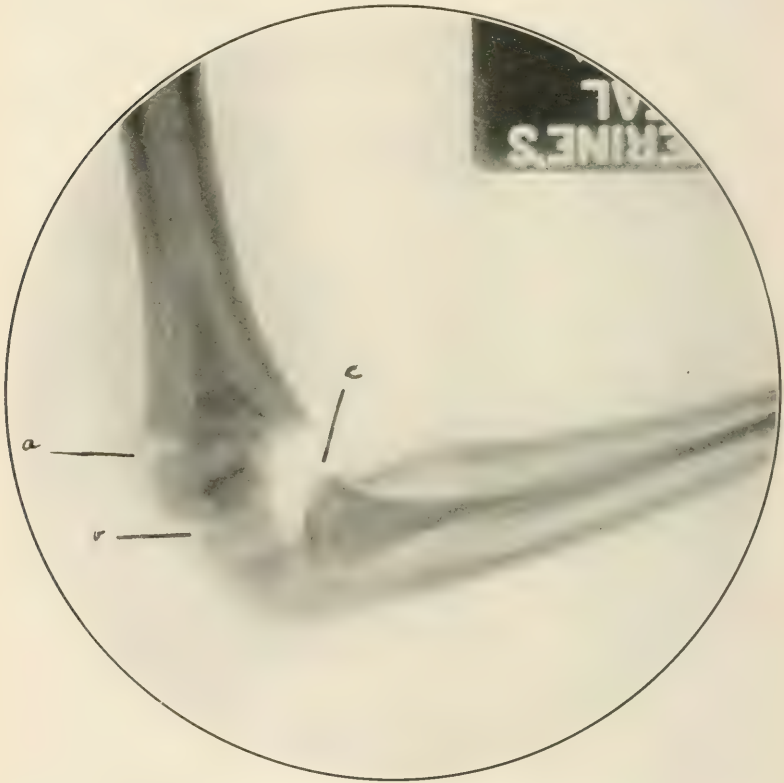


FIG. 1.—Supracondylar fracture, lateral view. *a*, Line of fracture; *b*, Epiphyseal line; *c*, Radial epiphysis.

3. Fracture of the external condyle.
4. Separation of epitrochlea.
5. Separation of epiphysis.

The supracondylar and diacondylar are the most frequent of the fractures of the lower end of the humerus.

The next most frequent type is fracture of the external condyle. Separation of the epitrochlea is not infrequent. Epi-



physeal separation (that is total epiphyseal separation) rarely if ever occurs.

Supracondylar fractures are usually oblique. That is, the fracture runs upward and backward. This is known as the extension type because the injury is sustained by falling on the



FIG 2.—Antero-posterior view of supracondylar fracture. Posterior and internal displacement of lower fragment. *a*, Lower fragment; *b*, Ossification beginning in epiphysis. This is the type of fracture which some surgeons confuse with epiphyseal separation.

hand with forearm extended. Very rarely we see the flexion type in which the fracture line runs upward and forward through the humerus. This results from a fall on the flexed forearm. In supracondylar fracture, the arm has much the appearance of a dislocation. There is a prominence posteriorly due to the back-

ward and upward displacement of the lower fragment. If the parts be palpated it will be found that the condyles are in their normal relation to the olecranon. There is lateral mobility obtainable by grasping the shaft of the humerus with one hand and the condyles with the other. Crepitation will also be present.

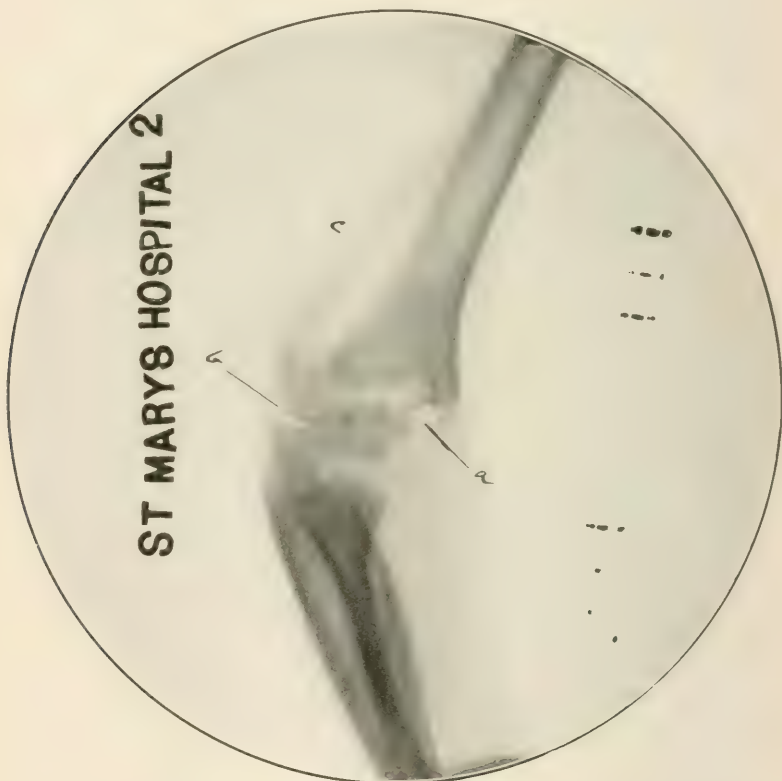


FIG. 3.—Diacondylar type of fracture with lateral displacement of lower fragment. *a*, Line of fracture; *b*, Epiphyseal line; *c*, Extensive stripping up of periosteum with a subperiosteal bone formation.

The diacondylar type of fracture is called by some a low supracondylar fracture. The fracture line is usually through the olecranon fossa. The lower fragment is displaced posteriorly and upward on the humerus. The symptoms in this type of fracture are the same as those of supracondylar fracture. This is the type of fracture which many surgeons and Roentgenologists have confused with epiphyseal separations. There is no injury

to the epiphyseal in these cases, and there is no more reason for calling them epiphysis separations than there would be to so classify fractures of the neck of the femur in children.

In fracture of the external condyle the epiphyseal portion as well as a part of the diaphysis is usually torn off. The fragment remains attached to the radius by ligaments so that there

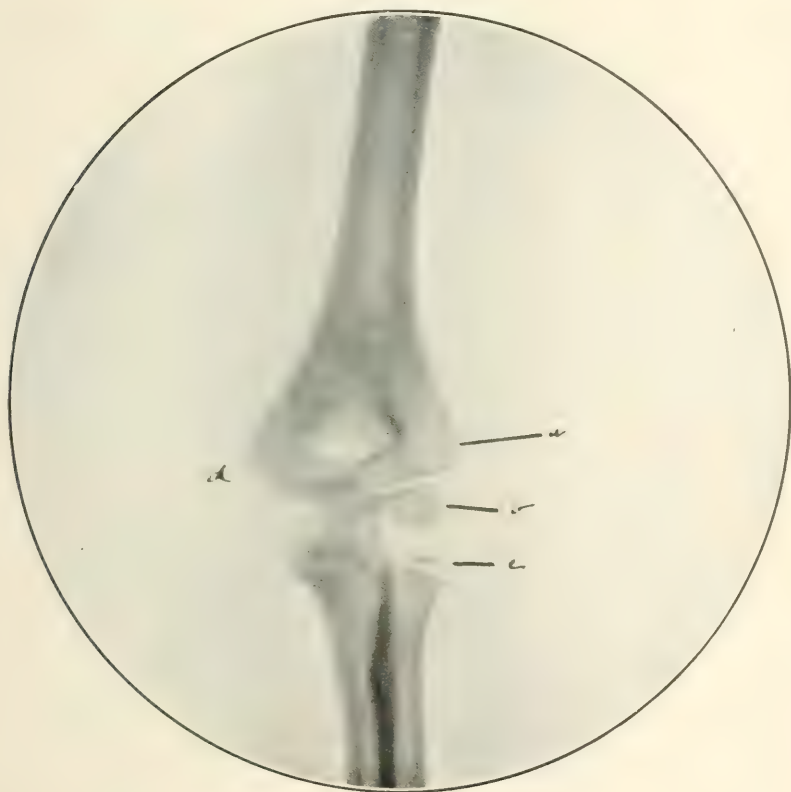


FIG. 4.—Fracture through the diaphysis very close to and parallel to the epiphyseal line. No deformity and few symptoms in these cases. *a*, Fracture line; *b*, Epiphysis; *c*, Radial epiphysis; *d*, Epitrochlea.

is usually not much lateral displacement. There may be some rotation of the fragment. The diagnosis is made on an injury confined to the outer part of the joint and a movable fragment. Crepitus may or may not be present.

Separation of the epitrochlea is not a serious injury as it

does not involve the joint. It may be due to muscular action or direct violence. The diagnosis is made on (a) localized pain and tenderness; (b) pain on active or passive movement of the flexors of the forearm; (c) the mechanism of the joint is unaffected; (d) the loose fragment may be detected usually displaced downward.

Separation of the lower epiphysis of the humerus with displace-

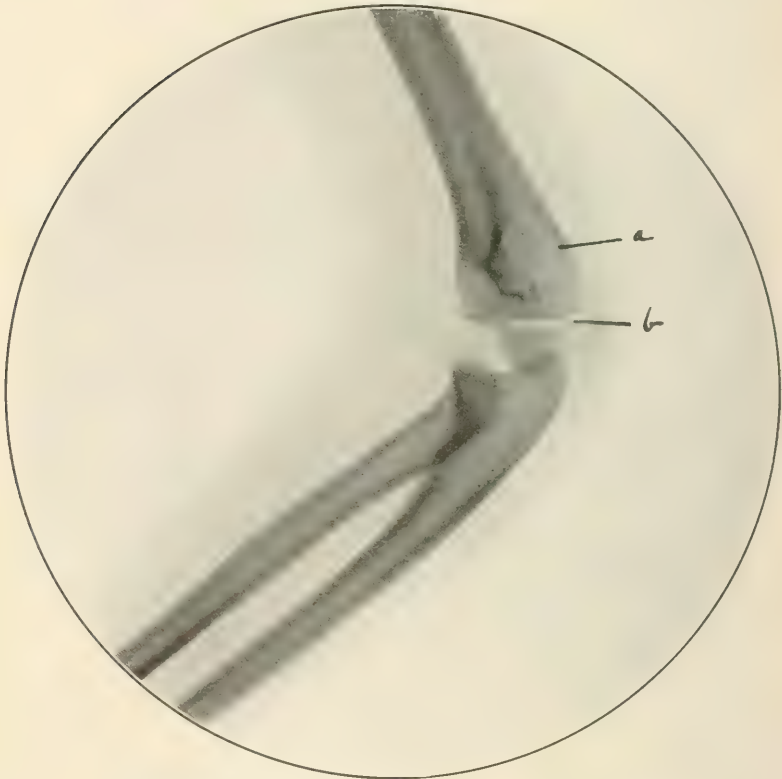


FIG. 5.—Linear fracture through external condyle without displacement. *a*, Fracture line; *b*, Epiphyseal line, ossification just beginning in radial head.

ment rarely if ever occurs. I doubt if there is ever a separation exactly through the epiphyseal line. There is a type of fracture of which I have seen a few cases. The child gives a history of fall and injury to the elbow. On examination there is noted slight swelling and slight limitation of motion. There is usually slight tenderness over the lower end of the humerus but no



deformity. Radiographs in these cases show a green stick or rather linear fracture of the diaphysis very close to and parallel to the epiphyseal line. This is the nearest approach to an epiphyseal separation that I have seen. In these cases there is no displacement and the fracture seems to be incomplete. They are usually diagnosed as sprains.



FIG. 6.—Separation of epitrochlea with marked displacement downward of fragment. *a*, Epitrochlea; *b*, Epiphyseal line; *c*, Epiphysis of radial head.

Now as to the result of injury to the epiphysis. I believe one may suffer quite some injury to the epiphysis without interfering with the future development and growth of the humerus. This must be true, in all of the fractures of the external condyle in children, a portion of the epiphysis is detached, and yet who

of us has seen any serious interference with the growth of the humerus.

I believe that in the past the condition which is now known as "Volkmann's ischemic contracture" was confounded with epiphyseal injuries. We now know that this condition is not a result of the injury but is an ischemic muscular paralysis due to tight bandaging.



FIG. 7.—Fracture through the external condyle. *a*, Fracture line; *b*, Center of ossification in epiphysis.

Fracture of the olecranon in children must necessarily be very rare as the center of ossification does not appear until the eleventh year. Fracture of the neck of the radius occasionally occurs. The diagnosis is made on (a) tenderness over the head of the radius; (b) rotation of forearm is painful and head of radius does not rotate with the shaft.

## SUMMARY.

Fractures of the lower end of the humerus in children are quite different in type from the adult. The most common fractures in their order of frequency are (a) supracondylar and diacondylar or low supracondylar; (b) fracture of the external



FIG. 8.—Fracture of the neck of radius with marked deformity. Antero-posterior view. *a*, Displaced upper fragment showing fracture below epiphyseal line of radius; *b*, Epiphyseal line of humerus; *c*, Epitrochlea.

condyle; (c) separation of the epitrochlea. Separation of the epiphysis as a whole rarely if ever occurs. Fracture of the olecranon rarely if ever occurs. Fracture of the neck of the radius is occasionally seen.

A CASE OF ACUTE DILATATION OF THE STOMACH  
COMPLICATING PNEUMONIA IN A CHILD.\*

BY

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ALTHOUGH abdominal distention, tympanites, is a commonly noted complication of pneumonia, one which is greatly embarrassing to the patient's condition and annoying to the physician, yet acute dilatation of the stomach alone, or concurrent with distention of other parts of the intestinal tube, seems to be far less often recognized and recorded. The surgeons are familiar with the acute dilatation of the stomach following laparotomy on excessive manipulation of the abdominal or pelvic contents, or after prolonged narcosis, and they have learned of the immediate relief afforded in this condition by the prompt use of the stomach tube and gastric lavage. Such a condition occurs, though not so frequently, in purely medical cases and the internist should familiarize himself with the recognition and treatment of this dangerous incident.

Our text-books on acute febrile diseases make but a passing allusion to this complication, and hence we owe our gratitude to Dr. Fussell of the Medical School of the University of Pennsylvania, who, in a recent article in the *American Journal of Medical Sciences*, reports a series of cases taken from his own practice together with half a dozen from the literature. Reading this article brought the condition vividly to my attention and I am personally indebted to his putting me on the alert, for but a few days after I had the good fortune to come upon just such a case:

H. C., male, aged two years, was seen by me in consultation with Dr. R. Finkelstein (to whom I am indebted for the clinical notes on the case) on December 23, 1911, with the following history: The child was taken suddenly ill on December 7, 1911, with an acute lobar pneumonia involving the left lower lobe. The disease ran its usual course and ended by crisis. The child was convalescent and was discharged by the doctor, when, one week later, he was called again and found him ill with a temperature of  $104^{\circ}$ , pulse 160, respirations 50, and a markedly distended abdomen. Complete consolidation of the left lower lobe was in evidence—apparently a reinfection of the same lobe. The abdo-

\*Read before the Brooklyn Pediatric Society, Feb. 28 1912.



men was markedly distended from the start. The child was given a calomel course and rectal irrigations, after which the distention subsided somewhat, but on the third day of the disease the distention was again more marked and when I saw the child the distention occupied mainly the upper abdomen, the epigastrium bulging out markedly, and a distinct tumor could be seen occupying the hypochondriac regions. Palpation, percussion and auscultation left no doubt that the tumor was an acutely distended stomach, the convexity of the large curvature reaching three fingers below the umbilicus. The lower abdomen was comparatively flat. The child had several bowel movements that day (I saw the child in the evening), but had not vomited. The general appearance was that of a very sick child. The pulse was very small—at times hardly perceptible; the heart sounds were very weak, the extremities cold; the face pinched; the respirations very rapid, sixty or more, the pulse about 160 and the temperature  $104^{\circ}$ . The child presented symptoms of the gravest nature, calling for immediate relief. We felt that the gravity of the situation was due mainly to the acutely distended stomach and we could hardly attribute the clinical picture to the localized pneumonic process. We decided to give a gastric lavage, and though fully realizing the dangerous condition of the child, anticipating the possibility of a fatal issue during the procedure, yet we thought that we owed to ourselves and the sick child the possible benefit of gastric lavage.

After administering a hypodermic injection of camphor, the doctor introduced a large sized catheter into the stomach and obtained a small amount of foul-smelling fluid and then washed out the stomach with a quart of warm weak solution of bicarbonate of soda. During the lavage the pulse was hardly perceptible, respirations quickened still more, but after the removal of the tube a marked improvement could be noticed in the pulse and breathing. All nourishment by mouth was stopped; only hypodermic medication was employed and the child was given nutrient enemas. Washing the stomach was continued for the following three days and it was repeated three times daily, and only on one occasion other than that already cited was some of the foul-smelling fluid obtained in the return. Besides such stimulants as camphor, caffein and digalen, the child received  $1/250$  grain of esserin hypodermatically every four hours until the distention subsided. On the seventh day of the second attack, the fourth day after the symptoms of dilatation of the stomach occurred, the stomach had apparently returned to its normal size, and the child was given nourishment by mouth. A distention of the intestines and colon developed, which yielded to the introduction of the rectal tube. The temperature began to go down on the day following and on the eleventh day became normal. On the twelfth it rose again to  $101^{\circ}$  and two days later to  $103^{\circ}$ . Empyema developed which was later operated and the child ultimately recovered.

I am sorry that I cannot supplement the clinical picture by any laboratory data because other than physical examinations were not feasible.

Acute dilatation of the stomach is a rare and usually fatal complication of acute infectious diseases. The postmortem findings in this condition are few. Usually there is a duodenal constriction at the root of the mesentery; the stomach is greatly dilated, at times filling the whole abdomen; the stomach wall thinned, but at times of normal thickness. The etiological factors which give rise to the acute dilatation of the stomach are: (1) Excessive manipulation of the gut in laparotomies, by far the most common cause; (2) Constriction of the duodenum at the jejunal junction. (3) Intense toxemia, notably pneumonia, as in this instance; or, typhoid or scarlet fever.

The symptoms which should draw our attention to this condition are:

1. Sudden projectile vomiting, generally of large amount, the vomitus varying from a yellowish, sour, creamy fluid to a dark greenish or blackish material, occasionally with a fecal odor. In some cases the absence of vomiting was noted. In my case there was no vomiting.

2. Great abdominal pain, which in some instances may be masked by delirium.

3. Distention, rapid, severe and mainly or only epigastric, which disappears with gastric lavage.

4. Collapse; the patient shows evident signs of shock, increased shallow respirations, running pulse, cold clammy sweat and drop in temperature, often to subnormal.

5. Constipation is the rule, yet a diarrhea from other concomitant causes has been reported.

6. On physical examination we may see visible peristalsis over the epigastric area, and often elicit the characteristic succussion splash of gastrectasia.

The diagnosis of this condition, occurring particularly as a complication of pneumonia, should be easy and with the disappearance of the tumor and the relief of the patient's condition on introducing the stomach tube, should leave no doubt in the physician's mind. However, this condition has been erroneously diagnosed and often overlooked, and I shall mention some of the common conditions for which it has been taken:

One—general peritonitis.

- (a) Here the stomach outline cannot be made out.

(b) There is more tenderness on palpation.

(c) There is no succussion.

(d) The stomach tube does not afford relief.

Two—intestinal obstruction.

(a) With the obstruction high up, a differential diagnosis is impossible. Besides, as has been suggested above, duodenal constriction is possibly a causative factor of acute dilatation of the stomach. In an obstruction lower down, however, the distention is more general.

(b) We may have intestinal gurgling.

(c) The stomach tube relieves only the epigastric tumor.

Pancreatic disease is also ruled out by the stomach tube as well as by the history of the patient's condition and the absence of the pathognomonic gnawing pain of pancreatitis.

Now as to the treatment. Having established a diagnosis, we should pass the stomach tube and immediately institute lavage with normal saline. We should not be deterred by the gravity of the patient's condition, which ipso facto is due to the gastric dilatation; the lavage should be repeated every few hours until the dilatation has permanently subsided. Change in posture aids mechanically and placing the patient on the right side or on his face relieves the duodenal kink.

As to drugs: Strychnin and eserin hypodermically will be found to be very useful adjuvants in restoring the tone of the gastric musculature. Food and drink by mouth for several days should be absolutely interdicted, nutrient enemata being resorted to. Thirst and fluid requirement can be advantageously applied in these cases by the Murphy drip.

As to the pathogenesis: Nothing definite is known. The majority of surgeons and internists are favoring the mechanical theory of the duodenal constriction, but the latest experiments with narcosis and the newer investigations of the central nervous system may cast a different light on the etiology of acute gastric dilatation.

It has been suggested that the cause of this dilatation lies in an acute anemia of the dorsal nucleus of the vagus. Where we are dealing only with an anemia of the nerve centers, there is a chance of recovery. In other cases active degeneration of the muscles has been found and these cases are inevitably fatal. The prognosis in acute gastric dilatation in pneumonia occurring during the febrile stage is as a rule fatal. Recoveries have been reported in those cases in which it occurred after the

crisis. In our case the dilatation occurred at the height of the disease and the recovery makes it still more interesting and unusual.

249 HEWES STREET.

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## TRANSACTIONS OF THE AMERICAN PEDIATRIC SOCIETY.

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*Held at Hot Springs, Va., May 29, 30 and 31, 1912.*

*The President, WALTER LESTER CARR, M. D., in the Chair.*

THE PRESIDENT'S ADDRESS: THE RELATION OF THE AMERICAN PEDIATRIC SOCIETY TO THE MOVEMENTS FOR THE REDUCTION OF INFANT MORTALITY.

After thanking the society for the honor conferred upon him, Dr. Walter Lester Carr of New York, said that the word conservation might have been overused but it nevertheless brought to our minds the improved conditions that prevailed in an awakened public sentiment regarding natural resources and an appreciation of the value of health and life. It was only necessary to look over the Index of the Transactions of this Society to note the changed point of view of the profession as evidenced by the titles of the papers presented in recent years. Now the topics concerned nutrition and problems of metabolism, while formerly the subjects were more often of clinical and pathological interest. Many influences felt by this society and similar organizations had been outside of their direct sphere of activity. Some of these influences had made a change in their attitude toward disease and they had assimilated them as part of the science of medicine. Latterly popular knowledge of science and medicine had led to the formation of societies with membership lists of physicians and laymen who had cooperated for the public good along educational lines. One such society, the aim of which had been, not only medical, but also progressive and educational, had brought to discussion the views of clinicians and sanitarians and by the publicity given to its meetings and publications had aroused popular sentiment and effected many reforms. In another society physicians had worked hand in hand with tenement visitors, staticians, and trained nurses to lessen the death rate in infancy. Boards of Health and Milk Commissions had enlarged the sphere of preventive medicine and their efforts had been reflected in this Society more largely perhaps than in any similar body of medical men. Reference was made to these efforts for conservation to show how far the public had advanced in its education and to revert to the fact that by increasing knowledge that could be understood by the public they gave them the power to combat disease and an



understanding of the influence of heredity, environment, infection, and lowered resistance. Making war against the origin of disease, they, as pediatricians, dealt directly with the formative period of life and had without intent on their part limited their activities along special lines of scientific work because, for a time, they seemed to have settled some important medical problems and to have relegated many medical topics to semi-medical organizations, over which they exerted only indirect control. This was the position they occupied in the broad problem of the conservation of infant life. Infant mortality, child labor, and physical betterment, although interwoven with economic problems, confronted them and they became more and more important with a lowered birth rate, as it was an essential requirement that the surviving members of the race should be endowed with the highest potential efficiency to improve their physical standards and to build upon them a more controlled and stable human machine. Allowing that there were many aspects of these problems that could not be made part of the regular program of their meetings, they had a responsibility that their organization could not pass on to those whose knowledge was less definite than theirs, nor could they in justice to themselves and to the community relegate the topics to other societies without giving them expert advice. They could widen their sphere of usefulness by having representatives appointed to affiliate with organizations having to do with the betterment of the child. Such representatives would confer on problems of social, economic, and pedagogic importance, and would be ready to present information of the physical needs of the growing child and the dangers of pathological influences. After referring to the work that was being done in the reduction of infant mortality in Continental Europe, Great Britain, and the Canal Zone, the speaker told of the work of the New York Health Department which showed that from the year 1808, when the death rate among infants was 203 per 1000, to the year 1911, when it was 120 per 1000, there was a decrease of almost 60 per cent. During the last quinquennium tuberculous diseases other than pulmonary tuberculosis had decreased 71 per cent. All diarrheal diseases combined showed a decrease of 43 per cent. The congenital diseases showed a reduction of 15 per cent. The mortality from all causes decreased from 229.46 to 146.25 per 1000 infants, a decrease of 36 per cent. The only cause which showed an increase was that of syphilis which increased 30 per cent. With all due allowance for the efforts of the organizations and the variation in death rate he believed that some results of the discussions of their society were shown in the mortality rates quoted. He thought that by constant repetition they had impressed physicians and the laity with the fact that prevention of disease was possible, and a study of cause was better than treatment of effect. Three things were essential to this society in order to insure its vitality and usefulness. First, they must

add to their study of diseases observed in infancy and childhood from the standpoint of their pathological and clinical histories, comparative and tabulated records, and methods of precision, so that they might judge more accurately of the semiology of disease. Their collective investigations on scurvy and epidemic poliomyelitis could be extended to other topics, bearing in mind that ever scientific topic was subject to review, and that there was none immutable and fixed. Second, a program relating to metabolic processes, more especially to those of infancy and childhood, arranged so that investigators would present to this society for discussion the results of laboratory investigations that bore on their clinical studies. From the nature of investigations made necessary along the lines of development and physiological growth, the laboratory offered the best field for experimental work and the pure clinician should await the deductions of members of the society who were laboratory workers. Many experiments on metabolism were as yet of limited value because they were links of an incomplete chain, the strength of which they could not judge until it was fully forged. Third, an endorsement of movements having to do with physiological and economic problems relating to infancy and childhood, particularly those of mortality and disease. Congenital diseases were among those that might be brought under this class. The society could not stand as the highest pediatric body in this country if it failed to recognize the many influences that were at work to lower the mortality in infancy and childhood nor could its opinions be made authoritative unless it cooperated officially with other agencies having this object in view. They should be ready to give hearty aid and approval to societies that approached pediatrics from standpoints other than medical.

A BRIEF REPORT OF AN EPIDEMIC OF SORE THROAT, WITH INVOLVEMENT OF THE CERVICAL LYMPH NODES.

DR. JOHN RUHRÄH of Baltimore said there had been reported from time to time in European cities certain epidemics more or less definitely associated with the milk supply, and some had been called septic sore throat. The report of the Marine Hospital and Public Health Service recorded eight epidemics that occurred in England, the first in 1881 and the last in 1905. In the examinations of many of the cases the streptococcus was found. In seven of the eight epidemics, one or more cows was discovered suffering from mastitis or from an eruption on the udder. In 1908 there was a remarkable epidemic that occurred at Christiana which was found to be due to the milk supply, and one cow was discovered with a diseased udder. Similar epidemics had been reported in other foreign cities. The first outbreak in the United States occurred in Boston in 1911, and was one of unusual severity, and was traced to one of the largest and best controlled dairies supplying milk in Boston. This year, in the

month of February, a similar infection was noted and Dr. Mark Richardson, Secretary of the Massachusetts State Board of Health, wrote: "We found at a milk depot of this firm conditions which we thought explained it. At any rate we requested that all the milk from this special milk depot be pasteurized, and the epidemic promptly ceased." A similar outbreak occurred at Concord, N. H. and Davis and Rosenow reported a large number of cases that occurred in Chicago. In Baltimore the epidemic began early in January; the cases increased in number throughout February and in the third and fourth weeks became very numerous. After the first three weeks of March were over very few of the typical cases were noted. Dr. Louis Hamburger prepared a number of charts which illustrated the various phases of the epidemic. The Baltimore epidemic differed somewhat from the other epidemics in that children were very largely affected, fully 50 per cent. of the cases occurring in early childhood. The organism, frequently in pure culture, which was seen in smears made from these cases, was a diplococcus with a distinct capsule, easily demonstrable with the usual capsular stains. It was Gram-positive. Its thermal death-point in milk was  $54^{\circ}$  C. at an exposure of twenty minutes. The symptoms of four classes of cases were given: the cases of mild type, cases of average severity, cases of severe type, and those with symptoms of unusual intensity, usually owing to some severe complication occurring at the onset. The complications attending this disease were remarkable for their number and their intensity; most common of all was the inflammation of the middle ear which occurred in from 30 to 40 per cent. of the cases. Next to this were irregular swellings, sometimes suggesting an edema, at other times suggesting abscess formation, although these swellings rarely suppurated. The lessons to be learned from this epidemic were: First, that a streptococcus infection might be caused by infected milk, and this disease might be exceedingly severe and attended with numerous complications and fatalities; second, that even in cold weather milk might be the source of disease; third, that no matter how carefully raw milk was handled it might at times be a source of danger, and fourth that the milk supply to cities should be pasteurized, and that where by accident the dairy company could not properly pasteurize its milk, it should be compelled to notify its consumers, so that they could either pasteurize or boil the milk themselves.

#### DISCUSSION.

DR. L. EMMETT HOLT of New York asked if Dr. Ruhräh could give them a line on how the disease got into the milk and what was the condition of the employees.

DR. CHARLES GILMORE KERLEY of New York said that the case reported interested him very much. He had seen a case in Brooklyn a short time ago in which the child developed an illness along about the same lines as Dr. Ruhräh's case. There was



redness of the throat and swelling of the glands which was followed by a mild pneumonia. The child was making a good recovery when peritonitis of a severe type developed. The symptoms subsided and it was believed that the child was well when an acute nephritis developed. There was urinary suppression for twenty-four hours. This acute condition improved when the peritonitis returned. The child finally died after four week's illness.

DR. SAMUEL MCCLINTOCK HAMILL of Philadelphia said that he understood that the final fall in the prevalence of the disease was due to the repasteurization of the milk from that dairy, but what he would like to know was to what the preliminary fall was due, the one that occurred in March. He asked whether they dispensed milk gathered from a large number of farms and if there was any disease manifested among the cattle on the farms. With regard to the cream on the market, they had at the last meeting of the Association appointed a committee which was to make a standard for the certification of all cream. This committee had done good work and they could now rely upon the cream.

DR. J. H. MASON KNOX, JR., of Baltimore said there were one or two points he wished to speak about. The first was a complicating erysipelas, of which he had seen two fatal cases. In both there was a little reddening of the throat but no bubos. In another case there were two swollen reddened areas with points standing from 3 to 4 cm. upon the skin. The erysipelas did not spread far in this case and the child made a good recovery. In another case which was very severe and accompanied by high temperature, there were marked bubos and otitis media. They were also concerned as to the possible presence of peritonitis. The child had a large spleen such as was seen only in malaria or splenomegaly. The child made a recovery but after a few days developed typical scarlet fever; it seemed that in some instances there was an organism associated with septic sore throat which gave clinical evidence of scarlet fever and he wished to know if any one else had such an experience.

DR. FRITZ B. TALBOT of Boston reported a case which he had seen in one of the children's clinics which a member of the Board of Health diagnosed as a diplococcus infection, and Dr. Ruhräh's report on the bacteriology of his case made this case more interesting. There was a very curious coincidence. During the two previous summers there occurred the same form of bacillary dysentery, but this summer there was a streptococcus infection of the gastrointestinal tract. A large number of babies also developed pyelitis. In the majority of these cases the pure culture of streptococcus was isolated from the urine.

DR. FRANK CHURCHILL of Chicago said they were having a similar epidemic in Chicago which was being carefully studied. Just how far they had progressed with this study he did not know but the epidemic could not be attributed entirely to one



particular milk delivery. The infection was severe and it attacked many doctors. In all the cases streptococci were found.

DR. JOHN LOVETT MORSE of Boston said they had had two similar epidemics in Boston, one in the spring of 1911 and one this last winter. The one occurring in 1911 was severe. It was not only traced to the milk but to the man that supplied the milk. This man had a sore throat. The striking feature of the Boston cases was not the severe original infection but the severity of the complications, such as endocarditis and general peritonitis, undoubtedly due to the blood infection. The cases with peritonitis were almost invariably fatal whether operated upon or not. In the epidemic of the present year there had been a large number of glandular involvements, but only a very small proportion of them suppurated. If suppuration occurred it was deep and gland after gland become involved.

DR. PERVIVAL JAMES EATON of Pittsburgh asked if the autogenous vaccines had been used in treatment.

DR. JOHN RUHRÄH of Baltimore, in closing the discussion, said that in answer to Dr. Holt's question as to how the infection got into the milk, he could not say; there had been a certain amount of investigation but they had been unable to determine this point. In England it was found that the disease originated from abscesses or other diseased conditions about the mammary gland. In Christiana the infection was traced to one cow in the herd which had a streptococcus identical with that causing the sore throat.

In answer to Dr. Hamill's question regarding the fall, he said he thought this was more apparent than real; the fall probably occurred in the children who had had the disease.

In regard to Dr. Knox's discussion, he said that in this epidemic the children had a rash strongly suggestive, but not at all typical, of scarlet fever. It faded away more quickly. As to whether the organism was a diplococcus or a streptococcus, it could not be stated as yet. Dr. McCleary had studied a number of cases and he had the idea that the organism was a pneumococcus. In nearly all of the cases there was a combination of the streptococcus and pneumococcus.

In many of the cases the streptococcus seemed to be the cause of the trouble.

In answer to Dr. Eaton's question regarding treatment, he said that the therapeutics employed had been very unsatisfactory. No vaccines had been used so far as he knew. When they had a case with high temperature, hydrotherapy was used. Many of these cases ran a continuous temperature and therapy did not have the slightest effect.

#### THE COAGULATION OF BLOOD IN INFANTS AND CHILDREN.

DR. HOWARD CHILDS CARPENTER and DR. J. CLAYTON GITTINGS of Philadelphia presented this communication. The value of a

reliable yet practical determination of the coagulation time of blood was obvious, yet the amount of experiment expended upon it within recent years testified to the difficulties inherent to most of the clinical methods which had been devised. The large majority of observations, however, had been made upon adults so that it seemed desirable to extend the study to infants and children, both in health and disease, in order to decide if possible upon a standard for comparison. Before presenting the conclusions of other authors and the results of their own work they considered the various coagulometers in use. Their clinical material had been drawn from the Children's Department of the Philadelphia General, University and Presbyterian Hospitals and the Children's Hospital. They had made 192 examinations on 176 patients. Of these, eighteen examinations of sixteen patients have an undetermined coagulation time, and re-examinations could not be made. Of 160 patients which gave a positive coagulation time, thirty-five were healthy, without ascertainable disease, except such afflictions as ring-worm of the scalp and scabies (eight cases); 125 cases suffered from a variety of diseases. Grouping all the healthy cases and those suffering from disease, they found the following: Healthy cases—average coagulation time, thirty-nine examinations, 9.4 minutes (5 to 14 minutes). Cases not healthy, average coagulation time, 135 examinations, 9.7 minutes (5 to 16 minutes.) This showed an unimportant difference between the well and the sick. Although the literature contained very little reference to the coagulation time in childhood as compared with adult life, the usual statement they found was to the effect that there was practically no difference except during the first few days of life, when a delay was observed. Their results for older infants and children showed no material differences from the accepted result, although the average for childhood was higher than the average for adults tested by the Biffi method. The author's was 9.5 minutes; Biffi's 7 to 10 minutes. A study of the published results on adults according to various methods emphasized certain facts. First, that in each individual disease the maximum and minimum figures usually showed a wide variation. They had alluded to this in referring to their figures for meningitis and nephritis. It was easy to see that the possibility of such variation in a selected case would be apt to negative the importance of the results. A second noteworthy fact was that the various diseases showed average differences which could hardly be considered of any real importance. They emphasized the importance of the fact that the average figures showed much less variation than those for the individual. Finally they found rather more than the usual disagreement in the results of various observers. Allowing for the personal factor and the difference in technic and method, the inconsistencies still appeared to be unduly suspicious. If those objections were true in regard to the results in adults, their work had proved them to be equally

true in the case of the child, with the added advantage that the examinations of the coagulability of blood in children were attended with increased difficulty. It would seem to them that future efforts should be directed toward solving the problem of blood coagulation *per se*, or to a study of coagulability according to the more advanced standards, *i.e.* the determination of the presence or absence, increase or diminution, in one or more of the various elements concerned in the formation of thrombin and in the latter's action upon fibrinogen.

#### DISCUSSION.

DR. ALFRED HAND, Jr., of Philadelphia asked if any such studies had been made in cases of typhoid fever and pneumonia. In both of these diseases there was quite a considerable formation of fibrin which caused a more or less plastic state of the blood and this might explain the beneficial effects from drugs used in lessening the plastic state of the blood.

DR. J. P. CROZER GRIFFITH of Philadelphia said that nose and throat men laid much stress upon the influence of certain agents upon the coagulability of the blood, but he was rather skeptical about them.

DR. HOWARD C. CARPENTER of Philadelphia, in closing the discussion, said that the coagulability of the blood in cases of bronchopneumonia was practicably normal, but that it would be a mistake to draw any definite conclusions from so few cases. There were more cases of bronchopneumonia experimented upon than of lobar pneumonia.

In answer to Dr. Griffith he said that he did not believe that such an examination by clinical methods meant anything except in the grossest way.

#### INCLUSION BODIES IN THE BLOOD OF SCARLET FEVER AS A MEANS OF DIFFERENTIAL DIAGNOSIS.

DR. MATTHIAS NICOLL, JR., and DR. ANNA M. WILLIAMS presented this communication, which Dr. Nicoll read. He said that Professor Dohle of the Institute of Pathology of Kieff had reported that in thirty cases of scarlet fever blood examined by him he had found almost with exception certain inclusion bodies in the polynuclear leukocytes. These bodies had not previously been described. By various methods of staining they could be differentiated from the nuclear substance, even when they lay near it. They could not be found after the sixth day of the disease. A large number of control cases were examined and inclusion bodies were found in but three. One of these was a case of pneumonia and the author thought the specimen might have been mislabeled, and the others were cases of carcinoma in one of which the bodies were not typical, and in the other the bodies could not be distinguished from those of scarlet fever. Dr. Martin Kretchmar of the University of Strassburg reported that he had been able to confirm Dr. Dohle's work. With the pur-

pose of testing these findings the writers of this paper had begun work. They had studied blood smears from fifty-one cases of scarlet fever, together with twenty-five control cases, with the result that forty-five cases of scarlet fever showed inclusion bodies such as Dohle described, and six failed to do so. Of the negative cases one had been ill for eight days or more, two for ten days or more, one for twelve days, one for fourteen days, and one for thirty days. The great majority of positive cases had been sick for less than a week, and most of them for less than four days. In making the examinations two or three smears were taken from each case; one was stained with Manson's stain and another with Giemsa's stain over night. The inclusions were found chiefly in the polynuclear leukocytes and varied in size and shape from small coccus forms to large irregular masses one-fifth the size of a red blood corpuscle. Bacillary forms were also seen. With Manson's stain the nuclei took on a deep blue color, the cytoplasm a very faint blue, and the inclusions a tint between the two. With the Giesma stain, the inclusions took on a clear delicate blue identical with that of plasmin. The nuclei colored magenta. With Manson's stain the inclusions stood out more clearly. In a fresh case of scarlet fever the bodies were found in nearly every polynuclear leukocyte. They had been unable as yet to determine how long the bodies persisted. Generally they were found during the first week at least. Of the control cases only three showed inclusions. These were a pneumonia case in a luetic patient, a case of erysipelas in an infant, and a complicated measles case in which the diagnosis was doubtful as to whether there was a complicating scarlatina or not. In order to eliminate the personal element from the investigation, the nature of the cases from which the blood was taken was not disclosed to the examiner until the findings had been jotted down. With the exceptions noted, not the slightest difficulty was experienced in picking out the cases of scarlet fever. At the present time, they thought they were justified in concluding that a blood examination in the first week of the disease would serve to differentiate scarlet fever from measles, German measles, and probably from toxic eruptions.

#### DISCUSSION.

DR. CHARLES GILMORE KERLEY of New York said that four weeks ago two children came down on the same day with a rash like scarlet fever but very atypical. Knowing of the work that Dr. Nicoll was doing, he sent him two slides for diagnosis. One slide was positive and the other negative. In the case which was reported as positive the rash disappeared in a day or two and the child was kept in quarantine and desquamated. The child reported as negative was kept in quarantine for ten days but did not desquamate. One of these patients had scarlet fever while the other had no signs of the disease. Dr.



Nicoll had certainly given them a tremendous aid in diagnosis these obscure cases.

DR. BUTTERWORTH of New Orleans said that twelve years ago he was interested in yellow fever and had studied the disease in Vera Cruz. After working for three months studying the blood in this disease he thought he had found a body which promised to throw much light on the subject. He published an account of it and found later that it was only a yeast fungi. He therefore advised them to "go slow" in this matter.

DR. MATTHIAS NICOLL, Jr., of New York said they had made an attempt to show how long the bodies would last but that they disappeared in from five to twenty-eight days. The work of differentiating scarlatiniform rashes was very interesting. Some of the cases were not at all suspicious and did not desquamate; they were unquestionably cases of German measles. With regard to Dr. Butterworth's remarks, he said he did not know what Dr. Butterworth meant; the bodies were present in scarlet fever and were not found in any other condition so far as he knew except in cases of sepsis. Just what the bodies were he did not know, nor did he care.

#### CONGENITAL OBSTRUCTION OF THE POSTERIOR URETHRA.

DR. J. H. MASON KNOX, Jr. and Dr. THOMAS J. SPRUNT of Baltimore reported this case. The patient was a boy five years old who had difficulty in controlling micturition from infancy, the urine passing every half hour of the day and night and was attended with no pain. Four weeks before death, there occurred a sudden onset of the terminal illness with cough, abdominal pain, vomiting and constipation. The physical examination showed malnutrition, purulent conjunctivitis, discharge from the left ear, tonsillar abscess, a tumor above the symphysis with a dull percussion note, redundant foreskin with phimosis. His hemoglobin was 70 per cent. He had no fever. Later his vomiting became more frequent and there were many convulsive seizures and a breathing that was suggestive of air hunger. He was circumcised three weeks before death with the result of slightly improving the flow of urine. All attempts at catheterization failed. At autopsy there was found an obstruction in the prostatic portion of the urethra, which was converted into a blind pouch by the fusion of its anterior and posterior walls, due apparently to an overdevelopment of folds normally present immediately distal to the verumontanum. A small triangular opening whose sides measured 3 mm. situated in the floor of this pouch was the only communication with the anterior urethra and through this the urine must pass. As a result of the urinary stasis there had occurred a marked dilatation and hypertrophy of the bladder, ureters, and kidney pelvis with typical hydro-nephrosis terminating in uremia.

They had been unable to find any case of congenital membranous obstruction occurring in the prostatic urethra reported

in full in the American literature, and yet the condition had not been infrequently described abroad. They believed that the possibility of interference to the urinary flow from such a congenital malformation should be considered whenever the cause of the obstruction was not obvious, especially should there be a persistently distended bladder. A partial obstruction of this nature was compatible with the passage of a normal daily amount of urine but there might be either increased frequency of micturition or incontinence if the lumen was not absolutely occluded. The condition if recognized could be easily corrected.

DR. J. P. CROZER GRIFFITH of Philadelphia said that he had a photograph at home which showed exactly the same condition. There was a great distention of the abdomen due to the bladder distention. The outer passages were entirely blocked, but he did not know the nature of the block.

#### STUDIES IN METABOLISM OF AMAUROTIC IDIOCY.

DR. HENRY HEIMAN, SAMUEL BOOKMAN, PH. D., and DR. BURRILL B. CROHN of New York City presented this paper. The obscurity regarding the true nature of this disease was still as great as ever. In view of the fact that this disease was so prominently characterized by a marked and generalized degeneration of nerve cells and nerve tissue it would be interesting to discover the chemical evidences in the excretions of the degenerative process which they knew to be going on. This should be evidenced by some disturbance in the excretion of those elements which were so largely an integral part of nerve tissue, namely phosphorus and sulphur. Despite the valuable information that could be expected from a chemical study, this aspect of the disease had been up to the present time almost entirely neglected. A perusal of the recent literature failed to show any extended metabolic studies. The opportunity having presented itself of observing two cases of this disease, it seemed worth while to undertake the study of its metabolism. Both were typical cases of amaurotic family idiocy. The first case was fifteen months of age, the second seven months. Histories of these cases were presented, and tables showing the daily averages of intake and output of nitrogen, sulphur, phosphorus and chlorine were discussed. Also tables showing the daily average retention percentage of intake and the absorption percentage of intake. From a perusal of the data before them, they were struck by the fact that absorption from the gastrointestinal tract and retention within the body were normal or even better than normal for all the constituents determined. A close scrutiny of the figures for the intake and output of phosphorus and sulphur did not disclose a marked disturbance in the metabolism of these constituents. Absorption and retention were unusually good and increased beyond the normal, and this probably indicated a hypernormal anabolic function occurring at a certain stage of the disease.

However, when one took into account the very slow process of degeneration, extending over a period of months or years, and the very small amount of actual phosphorus and sulphur in the entire cerebrospinal system, one could readily understand why the daily elimination of these constituents would fail to be manifested in a study of this disease for short periods with their present methods. It would be advisable, therefore, to study the disease at intervals during its course, both in its earlier stage where anabolic changes apparently predominated, and in the later stages where degenerative and catabolic processes played the important rôle

#### TYPHOID FEVER IN INFANCY.

DR. J. P. CROSER GRIFFITH of Philadelphia presented an analysis of seventy-three cases. Ten years ago Dr. Ostheimer and he had published an analysis of the collected cases of typhoid fever occurring in the first two and a half years of life. This included eighteen unpublished cases of his own or colleagues. He had added to these eighteen cases making seventy-three in all. More than half were under his own personal observation, the largest individual series yet published and he hoped that the series might be useful to their knowledge of the symptomatology of typhoid fever in infancy.

*Age*.—Limit fixed at two and a half years for various reasons. Of the seventy-three, eight cases (10.96 per cent.) were one year or less; thirty-five cases (forty-eight per cent.) from this age up to and including two years; thirty cases (41 per cent.) up to two and a half years.

*Race*.—Eighty-three cases white (86 per cent.) and ten colored.

*Family History*.—Only sixteen cases exhibited other instances of the disease in the family. This indicated that the statement was incorrect that typhoid fever in infancy occurred only or chiefly in family epidemics, since seventy-eight per cent. of his own cases occurred singly.

*Onset*.—The duration was established by spots or in some cases before these appeared by the knowledge from the temperature curve that the disease had reached its height. In forty-two cases the duration of onset could be exactly studied. In these he found an onset lasting two days in three cases; three days in three cases; five days in nine cases; six days or less in eleven cases; seven days or less in eleven cases. In at least forty-two cases, therefore—57.53 per cent. of the total number—the onset lasted not over seven days, and at least twenty (27.40 per cent.) not over five days, and in the remaining cases the date of the first observation was not early enough to allow of conclusions. The method of onset was studied in fifty-seven cases. In nineteen of these the onset was sudden, the child being severely ill in the first day. In sixteen cases the onset was rapid. This made thirty-five cases (61.4 per cent.) in which



the onset could be called rapid. In twenty-two cases (38.6 per cent.) the onset was more gradual.

*Fever.*—In cases capable of study the temperature rose rapidly. Probably three to four days would express the average time until the height was reached.

*Diarrhea.*—This was much more frequently seen than in early or later childhood. This was reported in forty-three cases (58.90 per cent.) and was doubtless moderate in other instances. In seven there was constipation and in five the bowels were undisturbed.

*Vomiting.*—A frequent symptom, yet seldom a severe one. The cases reported were twenty-five; in some only slight or occasional vomiting occurred. In some patients this was the chief symptom.

*Prostration.*—There were mentioned sixteen cases, and there were doubtless many others but of a moderate degree.

*Headache.*—There were reported fourteen cases, all of two years or more. This was a condition one could not tell about in the earlier age.

*Loss of Appetite.*—There were twenty-five cases, and this was a decided symptom.

*Cough.*—This was not frequent at the onset, only eighteen cases being reported.

*Epistaxis.*—This was very exceptional, only four cases being reported, a marked contrast to what occurred in adults.

*Distended Abdomen.*—This was not often mentioned and he had to report only five cases. Clearly this was not a common symptom of onset.

*Abdominal Pain or Tenderness.*—Only twelve cases were mentioned, all in the older subjects. This occurred probably oftener.

*Unusual Drowsiness.*—This occurred in eight cases. One case slept all the time.

*Convulsions.*—There occurred only three cases, a striking contrast to some other infectious diseases.

#### GENERAL CONCLUSIONS REGARDING THE ONSET.

The onset of typhoid fever in infancy was of decidedly shorter duration than later in life, the length averaging perhaps three to four days before evidence of the fully developed attack was present. The attack usually developed rapidly and was often sudden, only about one-third of the cases showing a slower appearance of symptoms. These symptoms consisted chiefly of fever, diarrhea, vomiting, prostration, headache, loss of appetite, cough in certain cases, fretfulness and abdominal pain. The temperature rose rapidly, diarrhea was more common than in childhood, vomiting was a symptom decidedly more frequently seen than later, and loss of appetite was often observed. Prostration was seldom marked. Cough, pain and distention were infrequent, and epistaxis was rare.

*Symptoms of the Attack.*—These might be said to date from the time the fever had reached its height and the disease in



general was well under way; or in other cases from the time the roseola appeared.

*General Conclusions.*—The fully developed attack of typhoid fever in infancy showed many digestive symptoms. There was coating of the tongue, but dryness and fissuring were exceptionally rare. Redness and swelling of the throat would probably be found frequent if examinations were systematically made. Decided loss of appetite was uncommon; vomiting was certainly much more common than in early childhood, being seen in decidedly the majority of the cases, but was seldom severe enough to demand specific treatment. Abdominal distention was frequent, probably more so than at later periods of childhood, but was seldom distressing. Bronchitis was common. The heart and pulse were seldom much involved. The nervous symptoms, on the whole, were not marked. The course of the temperature was not characteristic.

*Complications.*—Here especially were diphtheria nine; pneumonia seven; otitis eight; furunculosis five; measles three. In addition might be mentioned ulcerous stomatitis, ischiorectal abscess, parotitis, submaxillary abscess, jaundice, pertussis, intestinal hemorrhage, conjunctivitis, aphthous stomatitis, necrosis of the jaw, abscess of fingers, etc. A decided tendency to suppurative processes were seen in eighteen cases. There were three relapses, possibly four.

*Diagnosis.*—In sixty-one cases this was based on the Widal test.

*Treatment.*—This was entirely symptomatic.

#### DISCUSSION.

DR. ALFRED HAND of Philadelphia asked Dr. Griffith if he had been able to classify the cases so as to be able to tell how many were under one and how many under two years of age. The conclusions of Dr. Griffith bore out his own experience. The average duration of these did not differ so much from those occurring in older children. The cases of long duration were those with a lower temperature, from 101 to 102° F. The general type of the disease they were able to recognize readily as a rule it ran a short course with a high temperature, from 103 to 105° F. He believed it was as easy to diagnose typhoid fever in infants by the Widal test as it was in adults; in fact, this test was more valuable in infants as it was less likely that an infant had had a previous attack. A woman was admitted to the surgical ward with a diagnosis of appendicitis. The Widal test was made and was positive. It was learned that she had had typhoid fever six years previously, whereupon she was transferred to a gynecologist as a case of pelvic abscess. If there had not been a previous history of typhoid fever the Widal test would have given them a false sense of security.

Dr. Hand was surprised to hear of the high mortality in infants because he thought better results were obtained among

them. A 16 per cent. mortality was very high. Sometimes the initial infection was very severe and this caused the mortality to go up. Dr. Hand could not recall a single case of nose-bleed in an infant having typhoid. The disease in infants was certainly not recognized as frequently as it should be; many cases were at first attributed to colds or enteritis. Dr. Hand said that in his service, whereas, formerly they had twenty-one out of twenty-four beds occupied by typhoid fever patients, they now had only an occasional case.

DR. JOHN LOVETT MORSE of Boston said that Dr. Griffith's paper had covered the ground very thoroughly, and while his experience had not been as wide as that of Dr. Griffith it had led him to agree with Dr. Griffith's conclusions regarding the onset, the quicker fall of the temperature, and the greater severity and mortality of the disease in infants. He did not think the Widal test was necessary in order to make a diagnosis. The existence of leukopenia was a diagnostic aid.

DR. FRANK S. CHURCHILL of Chicago said he could not agree with Dr. Hand that the diagnosis of typhoid fever in infants was an easy matter; he thought it extremely difficult. Making a blood culture would nail the diagnosis quicker than the Widal test. The examination of the blood in was his opinion the only way in which they could make sure that they were dealing with a case of typhoid fever. Bronchitis occurred in 47 per cent. of the cases according to Dr. Griffith, but in his cases bronchitis occurred more frequently than this. He thought it occurred in from 90 to 95 per cent. of the cases. This complication was not always severe, however.

DR. CHURCHILL asked in what stage of the disease the leukocyte count was made.

DR. CHARLES GILMORE KERLEY asked how the infants were fed.

DR. GRIFFITH replied that he could not make an exact answer, but they were mostly on a milk diet. Sometimes they added other foods as broths.

DR. KERLEY said that the best way to bring up the mortality was to feed these children with typhoid fever milk. In twenty-four years of active work among children he had learned that milk was absolutely contraindicated in typhoid fever in infants.

DR. GRAHAM of Philadelphia said that his experience with typhoid fever corresponded largely with what Dr. Griffith had said, but he thought the mortality rate in infants was rather low, something below 16 per cent. Dr. Graham recalled the time when the hospital wards in Philadelphia were filled with typhoid fever cases whereas this year there had not been a single case in a certain hospital. Recently, however, he had seen three cases within ten days. There had previously been a case of typhoid fever in the house among the adults; children usually got the disease in such instances through personal contact with older individuals and this should be guarded against.

DR. FRITZ B. TALBOT of Boston reported the case of a woman

under treatment at the Massachusetts General Hospital; she entered three or four years ago while nursing her baby. Cultures of her milk showed the typhoid bacilli. He asked Dr. Griffith if any of the cases he had reported were breast-fed and if it was a common thing for babies nursed at the breast of a woman with typhoid to get the disease.

DR. HENRY HEIMAN of New York said he had found it rather difficult to make a diagnosis of typhoid fever in children unless they were in the midst of an epidemic and especially in the summer time with the usual accompaniments of gastrointestinal diseases. He made it a practice to have the Widal test made in suspicious cases. As to blood cultures, it was difficult to get into the veins of these little children; probably they would get an improved technic by which this could be done.

DR. SAMUEL ADAMS of Washington said that some years ago he called attention to the frequency of typhoid fever among children, a fact then not generally recognized. He called attention to an epidemic occurring in the Foundling Hospital under his supervision. A nurse was caring for ten babies and eight out of the ten were stricken with the disease. The nurse was supposed to be under the weather and would not give up her work; later she died in another hospital of typhoid fever. With regard to the high mortality, Dr. Adams said he wished to repeat what Dr. Osler had said when he reminded them in a like discussion that they were dealing with hospital cases and not with cases in private practice. There was a marked distinction in these two classes of cases; the patients brought to the hospitals were in far worse conditions than those in private practice and they came from a worse environment. In regard to blood cultures, he was glad to hear what Dr. Heinman has said; in one epidemic he had tried to get the best assistants that he could but those he got hesitated about attempting to take blood cultures in young infants; they would not take chances in babies under seven months of age. During the last winter they had great difficulty in getting cases enough to illustrate before a class of seventy-five. Washington was known as a malarial district and any case coming to the hospital with indefinite symptoms would be put down as maralaria, but he had not found a case of malaria in five years. So far as making a diagnosis was concerned Dr. Adams agreed with most of the speakers that it was not a difficult matter in times of epidemic or when it resulted from house infection; he had made diagnoses on very meager symptoms from the histories as presented to him by the parents.

DR. HENRY C. COIT of Newark, N. J., asked Dr. Griffith if in his experience he had received reports from laboratories of a positive Widal reaction in cases that presented no acute manifestations of the disease. This had occurred in his experience at the Babies' Hospital. This raised the question of infants being typhoid bacilli carriers. This question had been studied



by one of the men in the employ of the United State Government and the result of his work would be presented in a paper to be read before the Medical Society of the State of New Jersey at its meeting at Spring Lake.

DR. J. P. CROZER GRIFFITH of Philadelphia, in closing the discussion, said that in answer to Dr. Hand's question, 60 per cent. of the babies were two years of age or less. With regard to its being a long continued fever, it was his opinion that this was the case much less frequently than when the disease occurred in older children: In only two of his cases did the disease run for a long time; in these cases it ran forty and fifty days respectively.

In answer to Dr. Churchill, he wished to say that bronchitis occurred in at least 47 per cent. of the cases; it occurred so commonly that it should not be called a complication but a symptom.

In regard to making a blood culture in these cases, he did not think it was necessary in order to make a diagnosis. The Widal test was only made as a final test. With regard to the leukocyte count it was higher in infants than in adults; the leukocyte count was more easily increased in the young. None of the children were breastfed.

As to the mortality, he said he could not agree with Dr. Kerley that milk was the cause of the high mortality; he believed it was more often due to complications. In those cases in which no complications were discoverable there seemed to be a condition of sepsis that could not be attributed to the milk. If milk had a deleterious effect on infants with typhoid fever, it should have a similar effect in older children.

As to house infection, in only sixteen in a series of seventy-five was there evidence of typhoid fever in other members of the family.

As to the Widal test, it was made in every child supposed to have the disease, but in those cases which gave positive symptoms it was not made.

#### SOME FUNDAMENTAL PRINCIPLES IN STUDYING INFANT METABOLISM.

DR. FRITZ B. TALBOT and FRANCIS G. BENEDICT, S. B., of Boston presented this communication. Knowledge of the energy requirements of infants and the energy of their food was of fundamental importance in studying their rate of growth and in the treatment of nutritional disorders. The ideal method for determining the energy transformation of infants was that of direct measurement of the heat eliminated and produced, but this involved expensive, elaborate apparatus. The method which they wished to take up was that of so-called "indirect calorimetry," *i.e.*, a computation of the energy transformations from the gaseous exchange. It was possible to compute with considerable accuracy the energy transformations of an infant



from the amount of carbon dioxide produced, and particularly from the amount of oxygen consumed. Unfortunately direct determinations of oxygen were difficult to carry out and required complicated apparatus. The direct measurement of oxygen in young infants had but rarely been determined. Direct determinations of carbon dioxide produced by infants were less difficult and had frequently been made in a number of foreign laboratories. It was the purpose of the paper to point out the inconsistencies arising from the determination of carbon dioxide in infants without taking muscular activity into consideration. They were disposed to question the desirability of long experimental periods for establishing the basal metabolism of infants when such periods might include not only quiet sleep, but also periods of activity and even crying. It was necessary at the onset to find what was the ideal length of the experimental period in the infant. This, they considered, was the period in which the baby was asleep, absolutely quiet muscularly, and free from the slightest tremor and preferably without food in the stomach. The apparatus they used was a modification of that described by Benedict and Homans for experiments upon hypophysectomized dogs. Although the results of their investigations on the whole were not yet ready for publication, they felt convinced of the importance of considering in all subsequent metabolism experiments the pulse rate of the infant and particularly the degree of muscular activity. The enormous variations in the total metabolism as affected by what might otherwise appear to be slight muscular activity, were such as to lead them to question seriously all experiments made in twenty-four hour periods, and they wished to assert that all metabolism experiments in infants made without known controlled pulse rate and without graphic records of muscular activity were lessened enormously in value by the absence of these two factors.

#### DISCUSSION.

DR. JOHN HOWLAND of St. Louis said that he wished to praise the work they were doing and it seemed to him that if they were able to perfect the apparatus so that the amount of oxygen could be determined as well as carbon dioxide they would have added enormously to their facilities. Instruments such as were used by Dr. Lusk of New York were too expensive and required four trained men to work one of them. The methods employed in this country and abroad differed widely, so that it was practically impossible to make use of the information from foreign laboratories. The methods used abroad were those of fifteen or twenty years ago and their results were full of mistakes. They used twenty out of twenty-four hour periods whether the child was awake or asleep, quiet or crying. The result was that in the first period the metabolism was 20 or 25 per cent. higher than it was during the last period when the child became accustomed to the apparatus. Abroad they had installed apparatus of

the old kind in new hospitals and unless they improved upon their methods their published results were of absolutely no value. The determination of surface area and the calculation of metabolism was difficult because they had to use square and cube roots in the estimates; it was possible that some formula might be developed which could be used more readily and more accurately. Dr. Howland asked Dr. Talbot if it would be possible to perfect the apparatus so that they could measure the amount of oxygen.

DR. FRITZ B. TALBOT of Boston, in closing the discussion, said that in regard to the relation between the pulse rate and the muscular activity about which Dr. Hammill had asked, he did not know whether there was any definite relation. He could not tell just how much muscular activity there was. When the baby was quiet the pulse was apparently at its minimum rate. The charts showed that the pulse varied ten to fifteen beats during the course of three or four minutes. During the greatest muscular activity the pulse went to its highest point. He did not have sufficient data to enable him to draw any conclusion as to how much the elevation of the pulse would modify the amount of carbon dioxide excreted. All that he could state was that there was a definite relationship between the pulse rate and the amount of carbon dioxide excreted. The charts showed that in certain instances there was not sufficient exercise recorded to correspond to the elevation of the pulse rate. His only explanation was that the pulse rate was only taken once in every six minutes and the baby might have moved six minutes before. He hoped that by next fall they would have perfected their apparatus so that it would be possible to determine the amount of oxygen.

#### A CASE OF RETARDED DEVELOPMENT IN A BOY TREATED WITH THYMUS EXTRACT.

DRS. CHARLES GILMORE KERLEY and S. P. BEEBE of New York reported this case. The patient was a boy, sixteen years old, who was referred to him in February, 1910. The mother stated that he had made no perceptible growth in over two years and that his genitals were small and undeveloped and that the testicles were not in the scrotum; she was greatly worried, fearing that the boy would never be a man. The boy was mentally sound, was active in play, normal in mentality, as proven by his standing in school. He was in classes corresponding to other boys of his age. The examination of the boy showed him to be delicate in appearance and normal in all respects excepting that he was undersized. The penis was small and shrunken, the testicles were very small and although there was no retention and they could readily be brought into the scrotum, they rested in the canal a greater part of the time. There had never been an erection of the penis and there was no pubic hair or hair in the axilla. The treatment instituted was

that of lightening the school work, more hours in bed, and a suitable diet. Tonics were also ordered. At the end of nine months there had been a gain in weight of three pounds, the height was unchanged, and there was no change whatever in the sexual development. After conferring with Dr. Beebe all the medication previously given was discontinued and desiccated thymus extract, 15 grains daily, was prescribed. During the first six months of thymus administration the genitals, penis and testicles perceptibly enlarged and after nine months use the first erection occurred. This was novel and amused the patient very much. At the completion of one year of treatment hair appeared on the pubis and in the axilla. He had gained 1 inch in height and weight. The testicles have remained in the scrotum during the past six months. The sexual organs were apparently normal and well developed.

#### DISCUSSION.

DR. L. EMMETT HOLT of New York said that he was much interested in this paper, but, so far as his experience went, the report was interesting but not conclusive. He had seen boys develop so slowly that the advance was imperceptible, but soon they would take a start and improve wonderfully without any medication whatever. This was an interesting line for investigation. Dr. Holt related a similar case where the boy was sent West to a ranch and made a like improvement. One should be careful in drawing conclusions about these so-called specific medications. Dr. Holt said that he endorsed what had been said regarding the treatment of children who were not thriving.

DR. JOHN RUHRÄH of Baltimore said that he wished to refer to the use of thymus extract in marantic babies; he had used this agent in many cases of marasmus and the results obtained were about the same as when it was not used. However, he thought there was some close relation between growth and the thymus, and if it were possible to give enough one might obtain very satisfactory results from its use.

In connection with thymus extract medication in cases of malnutrition, it was interesting to note that Williams had obtained wonderfully striking results in these cases from the use of thyroid and he had tried to find out what cases the thyroid benefited and found that it was a case of "hit and miss." The results all looked alike. It made no difference whether they used thymus or thyroid.

DR. JOHN HOWLAND of St. Louis said that so far as experimental evidence went it was next to impossible to get evidence of any kind in regard to the thymus. A report appeared some years ago on the results of removal of the thymus in dogs; the bones were fractured after removal of the thymus and it was found that there was delayed union and that but little callus was formed. When these results were published they were questioned by a very good observer. In New York they had



removed the thymus from young puppies and from premature animals with no effect whatever. Other animals also were employed but it could not be determined whether the removal of the thymus made any change in the growth of the animal or not. So far as children were concerned the removal of the gland did not seem to have any bad effects; these cases should be followed at least to the time of puberty. Any medication like this was "hitting in the dark"; other glands might have been used with similar effects.

DR. FRANK S. CHURCHILL of Chicago said he did not agree with what Dr. Howland had said. There were forty-five or fifty cases on record that had been followed a sufficient time (up to puberty) to almost warrant them in drawing conclusions. It was impossible to entirely remove the thymus gland in infants no matter how small the gland might be; there was usually enough left to fulfill its function whatever that was.

DR. J. P. CROZER GRIFFITH of Philadelphia said that a number of years ago a Belgian physician had advocated the use of thymus gland in cases of stunted growth and with much enthusiasm. During the past winter he had had three cases under observation, cases which were almost examples of infantilism. The Belgian physician thought that pituitary gland might do some good and in one case he had used this, but so far there had been no increase in size or development. So far as gain in weight was concerned he did not know which of these internal secretions to give or if any of them could be trusted to do any good. They did not understand the physiology of these glandular secretions. Dr. Kerley's paper was very good in the way of experimental work. In studying the growth of children they might look in other directions and think of what the neurologists had taught them about the rest cure treatment. No child knew how to take care of himself, nor did the parents know how to care for the child. The child did not know when to stop playing or working. The parent as a rule pushed the child mentally and physically. For a number of years when treating a child who was not doing well he had enforced rest and had reached the conclusion that the results were extremely valuable.

DR. HENRY HEIMAN of New York said that the treatment by these organic products was empirical, but that in a great many cases of stunted growth in infants, the administration of thyroid in 1 grain doses three times a week gave excellent results. He had been using thyroid extract in those cases which, like Dr. Kerley's, were cases of infantilism.

DR. CHARLES GILMORE KERLEY of New York, in closing the discussion, said that so long as they could keep the little fellow growing they would continue the use of this agent, and would keep on using it until he stopped growing. He did not attempt to draw any conclusions from the case; it was simply an interesting exhibit. He had two other boys under treatment and they had improved.

*(To be continued.)*



## BRIEF OF CURRENT LITERATURE.

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### DISEASES OF CHILDREN.

**Convulsive Tendencies During and After Encephalitis in Children.**—The records of the Children's Hospital, Boston, from 1905 to date have been searched by W. P. Lucas and E. E. Southard (*Bost. Med. and Surg. Jour.*, 1912 clxvi, 323) for possible instances of encephalitis. Twelve such cases have been selected, seven of these having had convulsions during the acute attack. Of nine cases still living, five showed convulsions during the acute attack and two of the five are now epileptic. In both epileptic cases there was a brief interval between recovery from the acute attack and the onset of epilepsy.

**Tuberculosis of the Mesenteric Glands in Children.**—E. M. Corner (*Lancet*, Feb. 17, 1912) says that it has been proved that microorganisms are a hundredfold or a thousandfold more numerous in the cecum than in any other part of the alimentary tract. It may be assumed true for tuberculosis and other infective conditions of the alimentary tract. Hence they are at their maximum infectivity or septicity in the ileo-cecal region. To protect the body against this menace a large amount of lymphoid tissue has been formed in the ileo-cecal region. Hence the function of the appendix. There must be a continuous "ileo-cecal" strife between organisms and the lymphoid tissue. So long as the lymphoid tissue prevails the host is in good health. If the microorganisms get the best of the ileo-cecal strife the host is in bad health, and may suffer from appendicitis, colitis, or infected glands in the mesentery. There can be no mistake in assuming that the great entrance of tuberculosis from the intestine to the body is by the lymphatics of the ileo-cecal region, and that, therefore, tuberculosis of the mesenteric glands originates from there. The children suffer from ill-health and abdominal pains referred to the umbilical region. Those pains come on at night and sometimes after food. The loss of appetite is often accompanied by some disturbance of the action of the bowels, more often inactivity and constipation than looseness. The writer urges the very great frequency of tuberculosis of the mesenteric glands in children, and advises the removal of the appendix in such cases as a preliminary step.

**Acute Intestinal Obstruction.**—G. E. Wough (*Lancet*, Feb. 17, 1912) records an enterectomy with lateral anastomosis under spinal anesthesia for acute intestinal obstruction in a congenital hernia of the cord in an infant 24 hours old. The child survived for one month.

**Treatment and Prophylaxis of Scarlatina.**—Roueché (*Jour. de méd. de Paris*, Feb. 17, 1912) lays great stress on the preventive treatment of scarlet fever. He thinks that we have not as yet accomplished much by the use of sera, and that we should depend principally on absolute isolation of the individual, in a single room if at home, or in a separate compartment if in a hospital. It is of much greater importance to disinfect everything used by the patient, linen, dishes, and discharges, before they are removed from the room, than to depend on fumigation of the room itself. The length of these cases varies so much with the severity and complications that we should not assign any absolute length for the isolation, but should watch the throat and ears in which the poison remains a long time in some cases, while desquamation is of much less importance. He advocates the following treatment: as soon as the diagnosis is made, rubbing of the entire body with oil of eucalyptus, to be continued ten days; swabbing the throat and tonsils with wadding soaked in ten per cent, phenic acid solution, several times a day: these measures will prevent contagion and the patient may be treated in the same room with others without causing infection. Milne has treated 13,000 children in this way in an institution, with but 245 cases of scarlatina in thirty years. The author thinks that severe measures in treatment of the throat and nose are not necessary, and do harm. A milk diet should be used for about ten days, and then increased by the addition of bland foods containing little proteid material. There is no special treatment and symptomatic treatment is all that is available.

**Diphtheroid Bacilli of the Penis.**—By the term "diphtheroid bacilli" J. A. Kolmer (*Arch. Pediatrics*, 1912, xxix, 94) refers to a group of organisms morphologically similar to diphtheria bacilli, but without virulence when tested by animal inoculation. Such organisms, representing seven different types of diphtheria bacilli according to Wesbrook's classification, were found in 40 per cent. of cultures of the penis of 100 boys with healthy organs. Of these, 20 per cent. were beaded organisms, members of Group I, and resembling true diphtheria bacilli; 62.5 per cent. were of Group 2 and regarded as "doubtful," and 17.5 per cent. were of Group 3 and regarded as negligible by those diagnosing according to Wesbrook's classification. None of the cultures of the three groups gave the commonly accepted sugar reaction for diphtheria bacilli and all were avirulent for guinea-pigs. Diphtheria-like bacilli may be present on the circumcision wound for some time after operation and in the large majority of instances produce no harmful effects. However, the possibility of true diphtheria of the prepuce under such conditions must be borne in mind. The organisms found in two true cases of diphtheria of the penis reported by the author resembled those found on healthy organs in every morphological particular and demonstrate the fact that the bacteriologist must render a positive diagnosis on morphological characteristics, as acid production tests with the various

sugars and animal inoculation tests consume many days. The final disposition and treatment of a case should take the clinical aspect into consideration.

**Occurrence of Venous Hums in Children.**—The observations of H. R. M. Landis and I. Kaufman (*Arch. Pediatrics*, 1912, xxix, 90) are based on a study of ninety-nine children under fifteen years of age and twenty-six tuberculous adults. These cases seem to show that the venous hum is present in the majority of children under fifteen years of age, tending to diminish in frequency as that age is reached, and finally disappearing. The only relationship established between the murmurs and anemia was that it had less tendency to disappear in the recumbent posture when anemia was present.

**Use of Intestinal Antiseptics in Childhood.**—A. Hand, Jr. (*Archiv. Pediatrics*, 1912, xxix, 84) regards thymol, the naphthol derivatives and phenyl salicylate or salol as too irritating to the mucosa to be used in a dose large enough to have any value. Bismuth salicylate, however, he finds unobjectionable from this standpoint and possessed of undoubted antiseptic properties. Besides the direct disinfectant action of the salicylic radicle there is also obtained the sedative action of bismuth itself, which may also be enhanced by giving the subnitrate or the subcarbonate at the same time.

**Treatment of Infantile Beriberi.**—W. P. Chamberlain and E. B. Vedden (*Bull. Manila Med. Soc.*, 1912, iv, 26) say that while suspension of lactation is the logical procedure if infantile beriberi is a toxemia, it is unnecessary if the disease is produced by a deficiency of some substance in the mother's milk, provided the missing substance can be supplied artificially. They have attempted to do this by administering an extract of rice polishings to the infant, while permitting it to continue nursing. The infants were all given twenty drops of the extract of rice polishings every two hours while awake. Improvement is immediate. The vomiting stops in twenty-four or thirty-six hours. The child, who has not passed any urine for several days, urinates five or six times freely. The edema disappears in the course of a few days. Usually on the first night after treatment is begun the infant falls into a deep sleep, although it may have been practically sleepless for several weeks. The dyspnea and palpitation cease after two or three days. At the end of a week, or in less time, the patients are completely cured with the exception of the aphonia. After about two months of treatment, the voice usually returns quite suddenly. Full directions for preparation of the extract of rice polishings are given. The greater part of the mortality among breast-fed infants in the Philippines is probably due to beriberi.

**Dilatation of the Bronchial Tubes in Children.**—T. Fisher (*Clin. Jour.*, 1912, xxxix, 410) holds that dilatation of the bronchial tubes after measles is much more common than is generally believed and probably a much more common sequela than acute



or subacute tuberculosis. In very well-marked cases the signs and symptoms may be definite and the child a chronic invalid; in others, although there are physical signs of extensive affection of the lung, the child may appear to be in thoroughly good health. In others, again, judged by the evidence of physical signs, the dilatation of the bronchial tubes is slight, yet there is a chronic cough.

**Contact Infection in Contagious Diseases.**—The modern view of the modes of infection in contagious diseases is well expressed by B. V. D. Hedges (*Arch. Pediatrics*, 1912, xxix, 250). He says that the theory of infection by fomites and air has been accepted from time immemorial; not from scientific, but from *a priori* grounds. While admitting the possibility of infection from these sources in certain isolated cases, the danger is far less than commonly supposed. Contact infection and the danger to the community from "missed" and "carrier" cases are the most potent factors in the spread of these diseases. By observing the simple laws of personal cleanliness, by scrupulously cleansing the hands and nails after contact with these patients, the danger incurred by the physician or attendant in transferring the disease to others is reduced to a minimum.

**Diagnosis of Atypical Scarlet Fever.**—All experienced observers will agree with D. J. M. Miller (*Arch. Pediatrics*, 1912, xxix, 289) that the differentiation of unusual forms of scarlet fever will remain a stumbling-block to the practitioner, until we have discovered the cause of the disease, and are able to employ similar tests to those that we now apply to diphtheria, typhoid fever, syphilis, etc. Not one of the individual symptoms can be depended upon to establish the diagnosis. The disease may occur without rash, desquamation, fever or strawberry tongue. The most constant symptom is the angina; and its presence, associated with a scarlatinal eruption, however slight, however evanescent and however limited in its distribution, should be regarded as sufficient to establish the diagnosis—or, at least, to demand isolation and close observation. Next to the throat the condition of the tongue is the most reliable symptom, some enlargement of the papillæ of the tip and border being usually observable, although this symptom is much more frequently missing than is the angina, and may occur in other conditions. Of all the exanthemata, scarlet fever is the most varied and uncertain in its symptoms; and of all the symptoms, the rash presents the greatest vagaries. Hence, no rash, especially in a child, is too trivial to be disregarded, whatever the general symptoms may be. Scarlet fever with well-marked rash may occur without desquamation. Rubella scarlatinosa is often diagnosed when scarlet fever presents itself as a pronounced erythema with mild constitutional symptoms. The diagnosis of rubella should be accepted only upon the strongest evidence. The history of a previous attack of scarlet fever should not prevent us from treating with suspicion apparently anomalous cases



of the disease. Differential blood-counts have produced nothing of value in the diagnosis of scarlet fever. Surgical scarlet fever and scarlet fever following burns are scarlet fever in the wound and should be treated and regarded as ordinary cases of the disease. All doubtful erythemata and all cases in any way resembling scarlet fever should be quarantined until the diagnosis is reasonably established.

**Rumpell-Leede Phenomenon of Scarlet Fever.**—In 1909 Rumpell called attention to the fact that in scarlet fever hemorrhages could be produced into the skin of the elbow by application on the arm of a Bier's stasis bandage. He said this procedure was of value in diagnosing scarlet fever without an exanthem. At the suggestion of Rumpell, Leede applied a Riva-Rocca blood-pressure apparatus, found the diastolic pressure, lowered it to 45–60 mm. of mercury and then left the arm band in place five to twenty minutes. He found that in 200 scarlet fever patients this procedure invariably caused hemorrhages to appear on the anterior surface of the elbow. M. Michael (*Arch. Pediatrics*, 1912, xxix, 298) has studied this phenomenon in 100 normal children. She finds that hemorrhages into the anterior surface of the elbow joint can be produced in practically all normal children by applying sufficient pressure around the arm. A pressure of 60 mm. applied for ten minutes will produce hemorrhages in 60 per cent. of normal children, but to a much more limited degree. These findings corroborate those of Leede and other authors, showing that a positive Rumpell-Leede phenomenon cannot be regarded as a diagnostic sign of scarlet fever.

**Infantile Hypertrophic Pyloric Stenosis.**—As the result of a study of seven cases operated upon by himself, with three deaths, F. E. Bunts (*Amer. Jour. Med. Sci.*, 1912, cxliii, 14) places the symptoms of this condition in order of importance, ruling out reflex disturbances, as follows: Persistent vomiting, emaciation, visible dilatation of the stomach, visible peristalsis of the stomach, diminution and absence of stools, anuria, presence of palpable tumor of the pylorus. In only two of the writer's cases was the pyloric tumor positively identified. The high mortality seems to be due to delayed diagnosis and operation.

**Congenital Dyschezia.**—A. F. Hertz (*Brit. Jour. Child. Dis.*, 1912, ix, 145) says that owing to the acute angle formed at the pelvirectal flexure, the passage of feces along the intestines is obstructed at this point. Consequently the pelvic colon becomes filled with feces from below upward and the rectum remains empty until immediately before defecation. The call to defecation is a form of muscle sense, depending upon the distension of the rectum, which occurs as soon as feces pass beyond the pelvirectal flexure. If a response is not made at once to the call to defecation it returns only after a further quantity of feces has entered the rectum and produced a rise in the intrarectal pressure. All cases of constipation, can be divided into two

classes: Intestinal constipation, in which the passage of feces through the intestines is delayed, while defecation is normal; and dyschezia, in which there is no delay in the arrival of feces in the pelvic colon, though their final expulsion is not adequately performed. There is a class of dyschezia which depends upon a congenital deficiency of the muscle sense of the rectum. The condition can be recognized by making repeated digital examinations, when it is found that the rectum is constantly filled with feces, even immediately after the bowels have been opened. Dyschezia should always be suspected in severe cases of constipation in infants and children, when ordinary methods of treatment by diet, aperients and abdominal massage have failed. X-ray examination, after a bismuth meal, shows that the rate of passage through the intestines in infants is about the same as that of adults. In cases of this condition the child should take an ordinary diet, and neither aperients nor abdominal massage are required. When the stools are so hard that defecation is painful and difficult, a little liquid paraffin should at first be given. He should sit on a chamber for at least ten minutes every morning after breakfast and try to open his bowels, whether he feels the desire or not. If the attempt fails, he should be given a daily enema of either water or glycerin, gradually substituting glycerin by water. This process of reduction sometimes requires weeks or even months. If the condition is allowed to continue until adult life it may, in rare instances, be necessary to use enemata permanently.

**Pneumococcal Peritonitis in Children.**—S. Barling (*Practitioner*, 1912, lxxxviii, 557) states that a pneumococcal septicemia is rare in adults, their greater resistance enabling them to localize the invasion of the organism to the primary site of infection, usually the lungs. Pneumococcal peritonitis in the child may anticipate or be independent of any pulmonary lesion. The writer's compilation of 234 cases, including the twenty-eight upon which his paper is based, shows that 73 per cent. of the patients were females. There is not sufficient evidence, however, that the Fallopian tubes are the probable route of infection. The theory that infection comes from the gastrointestinal tract has received much support. Postmortem examinations in eighteen of the writer's twenty-eight cases showed a macroscopic lesion in only one case. Enlargement of the neighboring mesenteric lymph-nodes is rarely found in pneumococcal peritonitis. Local invasion of the bowel by the organism should manifest itself, at first at any rate, as a localized peritoneal inflammation; this, however, is not the case, the condition is from the first widespread and diffuse. The only theory that will explain the many features of the disease and account for the widespread and diverse lesions that are associated with it is to regard the infection as a septicemic manifestation. The primary focus is usually in the lungs, though in a certain proportion of cases the peritoneum only is attacked. Three clinical types may be recognized: Very acute

cases presenting marked abdominal features from the first, but with no other pneumococcal lesion in the lungs or elsewhere in the body; cases which simultaneously, or almost so, with the onset of the peritonitis develop a pneumonia; and those in which the septicemia is of a more chronic type which may develop an infection of both pleura and then of the peritoneum. Of the symptoms of pneumococcal peritonitis, pain, vomiting and diarrhea are very constant in their occurrence. The abdomen rapidly becomes tender, immobile and rigid and then distended, with fever up to  $103^{\circ}$  to  $104^{\circ}$ . Leukocytosis is generally absent on the first day or two; in the most acute cases no increase in leukocytes occurs throughout the illness. A rise usually begins about the third day and may go on to 40,000. In not a few cases differential diagnosis from appendicitis is impossible; but the early and diffuse rigidity and tenderness are suspicious signs, and if these are accompanied by initial diarrhea there is a strong suspicion that the case is one of pneumococcal peritonitis. In tuberculous peritonitis the constitutional symptoms are usually less severe and high temperature at first would suggest a pneumococcic condition. The mortality of the twenty-eight cases reported was 79 per cent. The type of case in which the best prognosis can be given is that in which the peritoneum only is attacked and there is no sign of involvement of lung or pleura; four out of seven of such cases recovered. All cases with pericardial involvement proved fatal. Treatment is early free incision and drainage, without wiping or irrigation. In the very chronic cases with residual abscesses in the pleura, peritoneum, or elsewhere in the body, the use of autogenous vaccines has been attended with considerable success, and should be used as a routine measure in such cases.

**Infant-feeding with Undiluted Cow's Milk.**—W. B. Hanbidge (*N. Y. State Jour. Med.*, 1912, xii, 188) records thirty-five cases of successful feeding with undiluted cow's milk. From  $1\frac{3}{4}$  to  $2\frac{1}{4}$  ounces of undiluted cow's milk per pound weight in twenty-four hours is sufficient to nourish a child. If that be so an infant on whole milk would only take about two-thirds as much liquid as one on modified milk. The child should be fed only when hungry.

**Modern Treatment of Tuberculous Peritonitis.**—E. Perier (*Ann. de méd. et Chir. inf.*, April 15, 1912) classifies the lesions in tuberculous peritonitis as the ascitic, with intestinal troubles, the fibrocaceous, with cheesy deposits and fibroid changes accompanying the ascites, and the fibroadhesive form. The treatment is generally medical, in a few cases surgical interference being of benefit. The especial treatment that the author describes is the method of recalcification; in addition to general and hygienic treatment the patient takes chalk powders, consisting of the carbonate, and tribasic phosphate of lime with sodium chloride. Absolute rest in bed is ordered; thick hydrocarbonaceous foods are given, such as gruels, without salt; and a large wet



compress is applied over the abdomen. This treatment is appropriate for all sorts of tuberculous peritonitis. Another treatment of value consists of sun baths, given every day, at first for a half hour, and gradually increased in length up to several hours daily. The patient sits in a reclining chair with a shield over the head to prevent the rays from affecting the brain. For the first two weeks the abdomen alone is exposed, and then the trunk also is uncovered. After the bath the patient is not fatigued; the perspiration is wiped off and he rests for a half hour.

**Curable Tuberculous Meningitis.**—H. Barbier and J. Gougelet (*Arch. de méd. des enf.*, April, 1912) state that tuberculosis attacks especially the meninges in children and a meningeal syndrome often accompanies attacks of tuberculosis of other organs, both when acute and chronic. But we do not always label these cases meningitis because the other symptoms of the malady predominate. The first symptoms are due to congestion, meningeal hemorrhages, and tuberculous arteritis with meningeal granulations. Then comes a serofibrinous exudation into the arachnoid cavities with serofibrinous exudate into the fissure of Sylvius. The authors find records of twenty-four cases of tuberculous meningitis said to have been cured, and add a fresh case observed by themselves. In these cases the chief interest lies in a succession of tuberculous attacks leaving permanent lesions though the patient recovers finally. The trouble generally begins in the pleura, and is followed by a meningeal lesion, which may come on after a fall or injury. As a sequela of such lesions there may be neuralgic affections of the various nerves due to tuberculous foci at their roots. When such meningitis is curable, meningeal thickenings leave sequelæ in the form of paralysis of the eye, face, and limbs, troubles of gait or of intelligence, aphasia, speech difficulties, blindness, and pupillary inequalities. Later, there may be headaches, and arrest of cerebral development in some cases. Many of the cured cases have the lymphatic facies, and glandular, or latent tuberculosis. Others have pulmonary, or peritoneal tuberculosis. Cure results from a regular life in the open air, without fatigue or overstudy, in the country but preferably not at the seashore or mountains.

**Erythema with Malignant Syndrome in Infectious Diseases.**—Hutinel (*Ann. de méd. et Chir. inf.*, April, 1912) states that malignant conditions accompanied by marked erythema are observed in typhoid, scarlatina, measles and diphtheria. The author believes that the streptococcus combines with the poison of the specific germ; the disease is not responsible for all the symptoms in these cases. These various eruptions, differing in form, still occupy the same regions; they occur on the knees, back of the feet, thighs, dorsal face of the hands, and sometimes on the face. It may be a simple plain erythema, or morbilliform, or scarlatiniform. The trunk of the body and the face are generally not involved. It may be papular, bulbous, pustular, or followed by ulcerations. It generally does not itch; it lasts from two to



seven days and desquamates like measles. The mucous membranes are not affected but the lips are excoriated, fissured, or ulcerated, and there may be necrosis. There are in severe cases a lowering of the temperature, variable, feeble pulse, lowered arterial tension, hurried respiration, adynamia, and prostration. In grave cases early death is to be expected. In other cases this condition comes on during convalescence. The liver is degenerated, and fatty; in the kidneys the pyramids are congested and the heart is soft and pale. The author is convinced that the organism of the disease is not alone responsible for these eruptions, but that the streptococcus is at the root of the septicemic condition present.

**Treatment of Nocturnal Enuresis in Children.**—J. Ruhräh (*Amer. Jour. Med. Sci.*, 1912, cxliii, 185) has used dried thyroid in a small series of unselected cases. In a small proportion of cases in which there were more or less marked signs that might be attributed to thyroid insufficiency, the results were quite remarkable. These were all children with adenoids and enlarged tonsils, or in some cases children in whom the adenoids and tonsils had been recently removed. The effect was obtained promptly or not at all. In every instance in which a favorable result was obtained a marked difference was noticed after the administration of one or two doses of the drug and in all cases within a week. Undersized children gained weight rapidly. It was not necessary to continue the thyroid over long periods of time. In several instances in which the children had high-arched palates but no subnormal temperature, the thyroids had no effect whatever.

**Poliomyelitis with Cortical Involvement.**—L. P. Clark (*Amer. Jour. Med. Sci.*, 1912, cxliii, 571) says that true motor aphasia, enduring mental enfeeblement such as idiocy, and genuine grand mal epilepsy would seem to make the diagnosis of cortical involvement in a case of poliomyelitis positive. The writer's case was seen at the age of eighteen. At two years of age he had one teething convulsion and a single convulsion at nine years during resuscitation after an accidental submersion. A typical attack of poliomyelitis at the age of fourteen was followed regularly two or three times every four months by attacks of grand mal. When seen by the writer, physical examination showed characteristic sequelæ of the attack of poliomyelitis. He argues that the epilepsy and poliomyelitis were not merely coincidental but that the former was the result of cortical involvement during the attack of poliomyelitis.

**Rupture of the Kidney in Children.**—C. L. Gibson (*Amer. Jour. Med. Sci.*, 1912, cxliii, 649) records four cases of rupture of the kidney occurring in children, the kidney in each of these cases being completely divided into two unequal portions. In one case the capsule was, however, not torn. Shock and other symptoms may be slight and out of proportion to the gravity of the lesion. Operative interference gives good results. Its

indications are discussed by the writer. His four cases recovered after nephrectomy.

**Anemia Associated with Rickets and Gastrointestinal Disturbances, Including Splenic Anemia.** H. T. Ashby (*Practitioner*, 1912, lxxxviii, 675) believes that splenic anemia is simply a secondary anemia, due to some cause common to these anemias, such as a toxin absorbed from the intestinal tract. In support of this view is the fact that we can trace cases starting from the simple slight anemia in mild rickets up to the severe anemia with enlarged spleen seen in splenic anemia. There is no hard-and-fast line between these anemias, and it is impossible to say exactly just where one type passes into the next. On these lines it is much more rational to consider the anemia, known as splenic anemia in children, as a secondary anemia, pure and simple.

**Hemorrhagic Disease of the New-born.**—B. Vincent (*Boston Med. Surg. Jour.*, 1912, clxvi, 627) add the histories of four cases treated by transfusion to three previously reported. These seven cases show that infants may be transfused with safety and without great difficulty by means of coated glass tubes of proper length and size. Experience in the last four cases has convinced the writer that the external jugular vein is the best vein to use in transfusing infants. The result of the operation in the six cases of hemorrhagic disease of the new-born confirms the conclusion of other men that this disease can be cured by blood transfusion.

**Recurrence of Adenoids.**—T. Guthrie (*Lancet*, Apr. 20, 1912) says that probably every one will agree that the great majority of cases of "recurrence" of adenoids are really instances of incomplete removal. It is no doubt the case that there always remain minute, perhaps microscopic, collections of lymphoid tissue from which a regrowth of the tonsil may occur. Indeed the most important factor is probably the age of the child, and it must be admitted that in children under four years of age there is a decided risk of recurrence; between the ages of four and seven the chances of recurrence are slight, and after the age of seven they are practically *nil*, always provided that the operation has been complete. Apart from the influence of age, it is certain that recurrence is much favored by an attack, within a short time of the operation, of one of the specific fevers, especially measles or whooping-cough. In children who are the subjects of congenital syphilis recurrence seems to be the rule rather than the exception unless the general condition is carefully treated. Lastly, recurrence is probably favored by the presence of untreated anterior nasal obstruction especially hypertrophic inferior turbinates, and is, therefore, apt to be met with in patients with high-arched palates and narrow nasal cavities in whom removal of the adenoid does not lead to the establishment of free nasal respiration. All of these conditions have the feature in common that they tend to excite or maintain a state of chronic postnasal catarrh, which should, therefore, wherever it is present, receive

appropriate treatment if the risk of recurrence is to be reduced to a minimum.

**Inflammation of the Suprarenal Glands in Scarlatina.**—Leon Tixier and Jean Troisior (*Arch. de méd. des enf.*, May, 1912) say that in scarlatina not all the glands are equally affected; the thyroid, parathyroids and hypophysis are not especially altered, but the suprarenals and pancreas undergo rapid degeneration. Lesions of the suprarenals occur especially in malignant scarlatina, the symptoms being so mixed with those of malignancy that they are indistinguishable. They consist of tachycardia, extremely marked, with arrhythmia, and arterial hypotension. The beats are feeble and the two silences become equalized. The cardiac dulness is not increased and cardiac dilatation is not noted. Asthenia is very marked, the patient lying inert, and fearing to move; sometimes there are convulsions and delirium. This condition is accompanied by pains in the epigastric region, of extreme severity. There is a brown discoloration of the abdomen, back, face, and mucosa. Infectious erythema occurs. Other symptoms are hypocholesterinemia and a meningeal syndrome. In the suprarenals the lesions are those of degeneration and hemorrhage with disappearance of the normal lipoids; the reactions of defense, diapedesis and functional adenomatous hypertrophy are reduced to a minimum. The pancreas shows interstitial degeneration, the acini being more affected than the islands of Langerhans. The reactions of diapedesis are extreme, and cellular hyperplasia is seen. As to the pathogenesis, the scarlatinal virus is combined with the streptococcus and lesions are of a septicemic nature. The indication for treatment is for the use of suprarenal extract, especially the extract of the whole gland.

**New Method of Insufflation of the New-born.**—Plauchu (*Jour. de méd. de Paris*, May 4, 1912) describes a new method of blowing air into the lungs of the asphyxiated new-born, by means of a rubber tube, accompanied by a sound marked off with a scale, which is introduced through the larynx and passed down until it reaches the dead space where exchanges of gas take place. Directions for the introduction of the tube are given. A rubber bulb is then compressed while watching a manometer, which gives an index of the pressure caused in the delicate lungs of the new-born child. This insufflation is continued according to the depth of the apparent death, until the child becomes less atonic and begins to breathe.

**Maternal Nursing after its Discontinuance.**—I. S. Wile (*Jour. A. M. A.*, 1912, lviii, 775) cites several cases which show that full maternal feeding may be resumed after its discontinuance for as much as one to two months in some instances. The regular sucking of an infant soon allows gradual and then complete replacement of the artificial feeding. Mastitis, unless there is pus in the milk, does not contraindicate breast-feeding nor do the mild infections. After abscess of the breast or the contagious



diseases every effort should be made to place the infant back on its mother's breast. Artificial feeding during a siege of sore nipples will give the nipples opportunity to heal and there will be little likelihood of losing the milk-supply providing gentle massage is practised at regular intervals. Unless this is done, however, it may require two weeks of nursing to secure a full milk supply when nursing is resumed. Mixed feeding or supplemental feeding is of great value while developing the maternal supply, especially during the first month. To prepare a milk-supply for puny infants advantage accrues from putting older or stronger infants to the mother's breasts to regulate and develop the supply. Every effort should be made to retain infants at the breast for the longest possible period.

**Treatment of Tuberculous Glands of the Neck in Children.**—W. G. Sutcliffe (*Practitioner*, 1912, lxxxviii, 641) says that the general tendency is to spontaneous cure. The essential point in the treatment of these cases is rest, either in bed or a spinal chair out-of-doors. In children, practically the only cases that require operation are those in which suppuration has already taken place. Soft, large glands, especially when painless, and small hard ones can safely be left alone; the former if due to enlarged tonsils will in most cases disappear with the removal of the causes of irritation, the latter are firmly encapsuled and do little or no harm. Where sinuses exist, as the result of the bursting of a superficial collection of pus, an operation is usually called for to remove the deep-seated gland that is the cause of the trouble. After the glands have been removed, tuberculin is of some slight service. The writer usually waits at least a month after operation before giving it, and then uses it for about three months. The thickening, if present, clears up more rapidly, and infection in neighboring areas takes place less frequently, when tuberculin is used.

**Comparison of the Streptococci from Milk and from the Human Throat.**—Studies by E. C. Stowell and C. M. Hilliard (*Amer. Jour. Child. Dis.*, 1912, iii, 287) have shown that streptococci from the human throat and from fresh milk very generally ferment one or more of the sugars, dextrose, lactose, maltose and saccharose, attacking them most readily in the order named. They do not generally ferment raffinose or mannite. The streptococci of the sore throat and the normal throat show no cultural differentiation in relation to the carbohydrates used. Virulence tests might have separated the two groups. The throat streptococci do not readily ferment at 20° C. any of the sugars used, while the milk organisms attack the same sugars and to the same extent at this temperature as at 37° C. This is, perhaps, the most valuable differential feature between chained cocci from these two sources.



THE AMERICAN  
JOURNAL OF OBSTETRICS  
AND  
DISEASES OF WOMEN AND CHILDREN.

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VOL. LXVI.

AUGUST, 1912.

NO. 2

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ORIGINAL COMMUNICATIONS.

THE EXTENDED ABDOMINAL OPERATION FOR CARCINOMA UTERI.

(BASED ON 500 OPERATIVE CASES.)

BY

PROF. DR. E. WERTHEIM.

Vienna.

(With Six Illustrations.)

Translated by

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New York.

A. THE DEVELOPMENT OF THE TECHNIC OF THE OPERATION.

From the beginning it has been clear that in order to obtain good results in the extended *abdominal operation for uterine cancer* the development of the technic was of great importance. Careful asepsis, rapid completion of the operation, a minimum loss of blood, careful handling of the organs to be liberated and the consideration of the heart in reference to the narcosis; all these points are of great moment in an individual already reduced in strength by the disease. We are, therefore, not in accord with Rosthorn,† who wishes to set aside the technical details with the remark that this operation should be carried out according to the idea of the individual operator. That other operators

\* The remarkable results obtained by Professor Wertheim in his radical operation for cancer of the uterus have aroused great interest in his technic. For the benefit of his English-speaking admirers a translation of his recent work is here presented, its publication being authorized by Professor Wertheim. It is regretted that lack of space prevents the publication of the 500 detailed case reports upon which the Monograph is based

† *Zentralb. f. Gyn.*, 1901, No. 21.

also lay great value on developing definite technic is shown by the many contributions which have been made to this subject.

The following points are of considerable importance:

1. *Prevention of Infection from the Primary Focus.*—The great mortality which followed the ordinary abdominal uterine extirpation very soon after its introduction by W. A. Freund, was principally caused by septic infection. In uterine carcinoma this danger is particularly great because in the carcinomatous focus dangerous germs in large numbers are invariably present. The advantage of the abdominal route, as compared with the vaginal is, that in the former the work begins in regions at some distance from the primary focus and comes in touch with it only after the vagina is opened. The latter can be deferred until the last step in the operation, that is, one can liberate all the genital organs together with the parametrium before the final step is taken to open the vagina.

At the beginning we hoped to solve this problem by cleansing the primary focus of the cancer, by means of curet and Paquelin cautery, but this procedure did not prove efficient (among our twenty-three cases four died of peritonitis). It occurred to us as it did to Werder\* and Viet† not to open the vagina from the abdomen at all, but to leave the liberated organs hanging on to the vaginal tube and remove them from below after the peritoneum of the pelvic flaps had been stitched and the abdominal wound closed.

This would have made it impossible for infection to occur from the primary focus, but in severing the vagina according to this method we find much bleeding from the paravaginal tissues, which is difficult to control on account of not being able to see properly and, as changing of the position of the patient meant a great loss of time and inconvenience, we again changed our method which is voiced‡ by Veit, and now sever the vaginal tube from above after all the organs have been liberated, but with the additional caution of clamping off the vagina first and severing it below the clamp. The clamps we used in the beginning for this purpose were bent at a sharp angle, but later, on the recommendation of Winternitz (Trübingen), the clamps were bent on a curve, made very strong and were applied on either side of the isolated vaginal tube, completely encircling it. In only a few cases was difficulty encountered in applying these forceps, on

\* AMER. JOUR. OBST., 1898.

† *Deutsche med. Wochenschr.*, 1891.

‡ *Prakt. Ergebnisse*, 11, 2, page 319.

account of restriction of space (225, 268, 312, 342, 368, 375, 404, 422, 430, 437). In all of these instances the difficulty encountered in applying the clamps was due to the fact that the carcinomatous infiltration was so great as to interfere with the proper yielding of tissues, particularly of the pelvic floor, or because of the great adiposity of the patient.

We believed that by using this method it was superfluous to cleanse the carcinomatous focus with curet and Paquelin. In cases where there had been a great advance of the cancer, after liberating the surrounding tissue and pulling on the uterus upward to facilitate the operation, we experienced, repeatedly, the accidental tearing of the carcinomatous focus in the uterus, on account of the thinning out of tissues. This accident happened thirty-two times, that is to say, 6.4 per cent., while Scheibe, from the Prager Clinic reports 10.2 per cent. On account of this, in spite of our using the vaginal clamps, we still adhere to the preparation of the focus by excochleation and paquelinization (from case 102 on).

We are in the habit of going about this procedure in a very exact manner; with bullet forceps we bring into view the hollow spaces created by the excochleation and thoroughly cauterize them so as to form a crust. If the space is firmly bound down one will not succeed in bringing the entire area at once into view and it is necessary to do the cauterizing by stages (bringing small portions successively into view by means of the bullet forceps).

We invariably practise this preparation immediately before the operation; if it be done several days before the operation an opportunity is given for inflammatory reaction to occur, which is caused by germs squeezed out during the excochleation, an event which not infrequently follows such a procedure. In spite of a most carefully conducted preparation and antiseptic tamponade, in a short while new secretions will appear from the carcinoma with development of bacteria. If a tamponade of very strong antiseptic is used (for instance a 10 per cent. chloride of zinc or formalin) it may injure the tissues severely, which has an unfavorable influence on the postoperative recovery of the patient. Mackenrodt is in the habit of using a curet several days before the operation and applies tincture of iodine immediately before the operation.

After the excochleation and paquelinization we fill the vagina with 1 per cent. sublimate gauze.

This preparation of a carcinomatous focus we dispense with only in cases where the uterus is so firmly fixed that the carcinomatous focus cannot be sufficiently approached (426-433).

The recommendation from many sources\* to extend the preparation of the focus of carcinoma, over many weeks, to free it of all germ life, is not practical in any case and it must be observed that to postpone the operation of a rapidly advancing carcinoma for that length of time is plainly not advisable. Even with all the above-mentioned precautions we are not completely satisfied because during the manipulation of the uterus incidental to the operation in spite of the preceding excochleation and paquelinization, infective particles may be pressed out of the carcinoma. Before the vagina is opened and immediately after the clamps have been applied the sublimate gauze previously introduced into the vagina is removed and, by means of sterile gauze the vagina is again cleansed. The vagina is then opened laterally sufficiently for us to push through enough sterile gauze to again clean the vagina and remove every bit of fluid which may have collected. One cannot too carefully guard against a possible infection from the primary focus. Similar proceedings are followed out at the Prager clinic.†

By these precautions we have succeeded in lowering the number of cases of infection until to-day we have a series of from twenty to thirty cases without a death, with primary union and with results that promise to be as good as with other laparotomy cases.

Recently individual operators have fallen back on our original method of extracting the liberated organs from below‡ with the idea that by this means they are more certain than by the vaginal clamping to prevent infection from the primary focus. We have never deviated from this method in cases where the *entire* vagina has had to be removed.

In any event it is a commandment to hold on to, that the vaginal tube is to be opened only as the last step in the operation. We cannot agree to any modification which allows the opening of the vagina a moment sooner than absolutely necessary.

The advantage to be gained does not outweigh the greater danger of infection. On account of the better view, and because one is in better position for the removal of all suspicious tissues, the operator should leave the uterus and sur-

\* *Berliner. gyn. Ges.*, 13, Nov., 1908.

† Scheibe, *Arch. f. Gyn.*, Bd. lxxxvii, p. 19.

‡ Zweifel, *Zentralbl. f. Gyn.*, 1909, No. 11.



rounding structures in position and patiently liberate tissue from all sides and in all depths until everything is freed down to and about the vaginal tube. We do not understand why Bumm says that the vaginal clamps cannot be applied when the cancer has advanced on the collum and cellular tissue of the ligaments of the uterus. It is not true that these parts can only be removed if the vaginal tube is severed first; these lateral tissue masses can be removed together with the extirpated organs in a very exact manner without opening the vagina.

For the same reason we do not practise the combined method of which the first act in the operation is a circular incision of the vagina from below. This method was first recommended by Breisky, who in this way hoped to avoid leaving behind diseased tissue, an event which he had observed in a case of uterine cancer in the Prager clinic operated upon by W. A. Freund. The circular incision of the vagina as the first step in the operation was undertaken by Freund with the idea of bringing about greater mobilization of the uterus. Later J. L. Faure,\* Brase,† and others have warmly recommended the circular incision of the vagina for the same reason. Admitting that by this means the carcinomatous uterus is given a greater mobility and that by our method the lowest portion of the cancer is not always within reach, by the circular incision the vagina is opened and as soon as the bladder or the rectum is separated from the vaginal wall communication is established between the vagina and the field of operation. The greater the amount of work that is to be done before the operation is completed the greater is the danger of infection from the carcinomatous focus. Moreover, a mere circular incision of the vagina does not increase the mobilization of the uterus, as this depends principally on the severing of the paravaginal and parametrial tissues. Kleinhaus, who was the first to employ the abdominal method,‡ clearly says that the liberation of the vagina up to the *partio vaginalis* does not make the operation less difficult. So far as the lower boundary of the cancer is concerned, one is able to determine this boundary by very little practice without opening the vagina and to apply the vaginal clamps as low on the vaginal tube as is required.

The method of clamping the vagina has an additional advantage that it permits an easy removal of the vaginal wall, a point

\* *Congr. intern. de Chirurg.*, 1908; and *Traité de Gynecologic Medico-chirurgicale*, Paris, 1911.

† *Berliner gyn. Ges.*, Nov., 1908.

‡ *Prager med. Wochenschr.*, 1902.

the value of which is admitted by all. Naturally the removal of the vaginal wall presupposes its thorough previous isolation, which can be readily accomplished on account of the ease with which it can be approached from above.

It is to be observed that Irish\* has condemned the combined vaginoabdominal operation for uterine carcinoma and says that the combined operation has the dangers of both vaginal and abdominal hysterectomy.

2. *Care of the Wound.*—The best way to drain the peritoneum after gynecological operations is through the vagina. The same holds good after complete uterine extirpation.

After completing the enlarged abdominal operation we desist, as a rule, from all drainage of the peritoneum and unite the peritoneum of the bladder with the peritoneum of Douglas. We employ peritoneal drainage only in cases where it is indicated, as in other laparotomies—namely, after pus is spilled, where large raw surfaces must be left behind, or where there is danger of bowel perforation.

We consider it judicious to drain in cases where the entire pelvis has to be laid bare, where large masses of parametrium and paravaginal cellular tissue, and, perhaps, lymph glands have to be removed, where relatively large spaces in nooks and corners are created. In these cases after closing the peritoneal folds, we drain the pelvis to avoid collection of blood or serum. The possible presence of streptococci† in the opened-up connective tissues strengthens the indication for instituting this drainage.

We use a small short piece of iodoform gauze for the drainage and fill out the space on both sides of the pelvis; after the fourth or fifth day the gauze is gradually withdrawn and entirely removed by the ninth day.

In a few cases, where larger masses of lymph glands have had to be removed, forming deep pockets para- and retrovaginally, it has been necessary to split up the vaginal tube so as to afford proper drainage (for instance, 465, 478). Amann proposed that in these cases drainage should be provided for along the vagina and brought out through the ischiorectal space.

By adhering to these methods, we have observed a relatively small number of subperitoneal collections of pus; in all eighteen cases (17, 25, 36, 48, 77, 95, 133, 153, 167, 169, 176, 233, 271, 276, 407, 472, 488, 489). In seven the retention of pus was complicated by necrosis of the ureter (17, 36, 133, 169, 176, 276, 407) and

\* *Boston Med. and Surgical Journ.*, Mar., 1899.

† Barth, *Arch. f. Gyn.*, Bd. 87, H. 2.

very likely in a small proportion the primary cause was the necrosis of the ureter, and escape of urine through the fistula. If the ureter necrosis and the fistula formation occurs later, after the drainage has already been removed and the subperitoneal space is no longer in communication with the vagina, then the escaping urine cannot find an outlet through the vagina, but collects about the fistula, forming a cavity filled with urine. It is self-evident that conditions of this kind will lead to suppuration.

It has been repeatedly declared\* that subperitoneal drainage leads to ureter necrosis, because gauze or drainage tubes isolate the ureter from its surroundings, press on it, and unevenly fill out the space in which it rests and so cause kinking and uneven pressure on the ureter. Besides this, it is claimed that the extensive communication between the bed of the ureter and the vagina favors secondary infection. This supposition, however, is hardly justified by facts.

In our experience ureter necrosis does not depend upon drainage. It is wrong to place gauze for drainage in such a way as to press on the ureter. What needs to be accomplished is to prevent an early closure of the subperitoneal space and it is sufficient in introducing the drainage to pack the gauze on both sides and it is not necessary to have it come into contact with the ureter.

We are in accordance with Scheib† who considers drainage of the subperitoneal space of importance in those very cases where ureter or bladder necrosis is apt to take place. In the majority of our cases where the urine escaping from the ureter fistula did find a ready exit through the vagina we could thank the introduction of the subperitoneal drain for this occurrence.

In those cases where subperitoneal pus retention had occurred, we could evacuate it and bring about a cure by boring with the finger into the space through the vagina. In a few cases the dilatation by means of the finger had to be practised daily (77, 95, 153, 271, 169, 489). The dilatation was always followed with a douche containing tincture of iodine. In only a few cases did this procedure prevent invasion and it was then necessary to make an incision above Poupart's ligament along the anterior-superior spine of the ilium. In a few cases drainage tubes had to be used through the vagina (48, 167, 276)

\* Bumm, Stockle and Franz.

† *Arch. f. Gyn.*, Bd. lxxxvii, pp. 32, 33.



Seven cases with subperitoneal suppuration died. In case 17 uremic coma set in after extirpation of the kidney on the side where the ureter fistula existed; in case 133 autopsy showed suppurative bronchitis with an abscess on the right side of the pelvis; in case 33 the entire subperitoneal space was gangrenous on both sides and in case 25 death was due to suppurative pyelonephritis; in case 472, a woman sixty-four years of age, the autopsy showed suppuration of the pelvic cellular tissue, myocarditis and pulmonary emphysema; in case 488, pyemic foci; in case 407, in spite of incision above Poupart's ligament and through-and-through drainage through the vagina, death was due to a phlegmon of the cellular tissue and peritonitis. As a result of our experience we made it a rule, in all cases, to make a digital exploration where fever or pain or after-bleeding was interfering with the healing of the subperitoneal space (case 288) and, furthermore, to do similarly in all cases where there was a suspicion that a ureter fistula would occur. Where a ureter fistula has occurred it is our rule to keep the parts thoroughly cleansed by douching with dilute tincture of iodine.

Other operators have different methods in caring for the wound. In the Veit's clinic, in spite of the investigations of Fromme, who was the first to demonstrate bacterial invasion of the regional lymph glands in uterine carcinoma, they closed the wound above and below.\* The main point is to prevent infection of the field of operation from particles of the primary focus, which in about half of the cases is infected with hemolytic streptococci.† The streptococci present in the parametrium and lymph glands are not so virulent and according to Veit it is sufficient in order to avoid infection, to operate with neatness, avoid smearing the parts with blood and fluids, avoid the handling of the connective tissue with the fingers and operate as dry as possible, as recommended by Zweifel. According to Barth, vaginal drainage is to be used only in those infrequent cases where hemolytic streptococci are present in the parametrium and peritoneum.

While Bumm and his followers, as has already been mentioned, have firmly abstained from subperitoneal drainage and in fact from all drainage since the year 1907, they have changed their method and instituted drainage of the peritoneal cavity. They changed their methods because the bacteriological investigations of Liepmann, who, with a triple test in contrast to Barth, demon-

\* *Arch. f. Gyn.*, Bd. lxxix, H. 1. Veit, Dresdener Kongress.

† Barth., *Arch. f. Gyn.*, Bd. lxxxvii, H. 2.



strated that the parametrium is not alone very frequently infected by streptococci, but that these germs are of a very dangerous nature. The two peritoneal flaps are stitched to the anterior and posterior walls of the vagina so that the latter organ is left open and by means of a tampon as large as a fist the peritoneum is pressed against the raw surfaces of the pelvis. By this means sepsis and peritonitis, which played so important a rôle, were made to disappear and the mortality due to infection was reduced from 38 per cent. to 5 per cent.,\* Bumm† also decided on drainage by the method of leaving the peritoneum unclosed. In the clinic of Küstner double drainage has been used since March, 1909, subperitoneal from below and interperitoneal from above.‡ Veit\*\* now also leaves the peritoneal cavity open and after uniting the two leaves of the peritoneum to the anterior and posterior wall of the vagina, drains outside. In distinction to Bumm he does not suture the lateral regions in the neighborhood of the ureters as he fears the collection of wound secretions beneath the peritoneum.

In view of our results (we find ourselves again with an unbroken series of twenty-eight cases with faultless healing) we do not see any occasion to change our present method of the *care of the wound*.

Our caution against infection from the carcinoma justify us in considering the radical abdominal operations as an aseptic one. Even breaking into the carcinomatous cavity during the operation does not change matters if an immediate and a thorough cleansing of the carcinomatous cavity has been carried out. If the operation is not carried out aseptically then the Bumm-Veit method of the *care of the wound* has its advantages.

3. *Hemostasis*.—The control of bleeding is the most difficult of the problems of the radical abdominal operation, not, as it has been thought, on account of the extirpation of the regional lymph glands, but because of the removal of the parametrium. The more thoroughly the latter is removed, the nearer one gets to the pelvic floor and the more difficult it is to avoid the close lying veins of the pelvic fascia, which bleed more or less, and the control of which is by no means easy. For this reason, as has been done by others, we practised (from the thirteenth case) preventive ligation of the hypogastric arteries, but saw ourselves, as did also

\* Kromer, Naturf. Vers. Klon., 1908. Lipeman, *Berliner klin. Wochenschrift*, 1908, 22.

† Scheffzek, *Zentr. f. Gyn.*, 1910, No. 11.

‡ Walter Hannes, *Zeitschr. f. Geb. u. Gyn.*, Bd. lxvi, H. 1.

\*\* Prakt. Ergebn., 11, 2.

Legueu,\* disappointed in our expectation. In spite of the hypogastric ligature the uterine artery on being cut spurted as hard as though no ligature was applied and, therefore, we soon after discontinued the practice (to case 21).

From the ninety-seventh case on we availed ourselves of the use of the so-called parametrium clamps, that is to say, clamps properly curved and closing exactly, of which three or four are sufficient for each side. These clamps are applied on the roots of the parametrium against the pelvic floor and prevent bleeding from individual points. On account of their curves the clamps are easily replaced by ligatures. The use of these clamps is a certain prevention against air embolism, for which Mackenrodt recommends a preventive provisional compression of the principal venous channels.†

The application of the parametrium clamps has given us valuable service. As the bleeding is prevented, the operator has a better view of the field of operation. Mackenrodt‡ criticises us claiming that by the application of these clamps more parametrium is left on the pelvic floor. We cannot agree to this as happily, these clamps can be very closely applied on the pelvic floor.

4. *Treatment of Ureters.*—The liberation of the ureters is a necessary step in the radical abdominal operation.

As a rule it is easy to locate the ureters. Often the pelvic portion of the ureter shows through the peritoneum and one only needs to split the peritoneum in an appropriate place to reach it, liberating it from the cellular tissue. In cases where the subperitoneal fat is thick or where the parametrium is thickened the ureters will not be seen, nevertheless they can be reached readily by splitting the peritoneum. From case 227 on we followed Bumm's and Krönig's recommendation; after tying and cutting the ligamentum infundibulopelvicum, we open up the two leaves of the ligamentum latum by blunt dissection and search for the ureter between the two leaves. As a rule this proves to be a little more difficult than with the first method, but it is relatively easy. Sometimes the ureter will reveal itself by its peristalsis. There is some advantage in this method, as the ureter does not suffer complete isolation; it remains on the posterior peritoneal fold, besides this there is a more ample peritoneal fold left which is of service at the close of the operation.

We have never practised the preliminary catheterization of

\* Cong. de Chirur., Paris, Oct., 1899.

† *Zentr. f. Gyn.*, 1907, No. 19, p. 541.

‡ *Zeitschr. f. Gyn. u. Geb.*, Bd. liv, H. 3, p. 526.

the ureters\* allowing the catheter to remain *in situ* during the operation. It is in our opinion superfluous to do this as it does not leave the mucous membrane of the ureter unharmed.

It may be difficult to find the ureters, if inflammatory reaction has altered the peritoneum, or where the carcinomatous process has invaded the pelvic floor, or where previous operations have been done. In cases where the subperitoneal cellular tissue has become tough and unyielding, search for the ureters results in bleeding which becomes a great obstacle to the finding of the ureters. In five cases (Nos. 292, 364, 394, 476, 479) it was impossible to find the ureters in the pars pelvica and it was necessary to lay bare the pars vesicalis and work backward to the pars pelvica. The preliminary exposure of the pars vesicalis, however, is a difficult procedure as it is necessary to liberate the parts down to the trigone of the bladder. In case 402 it was necessary for us to look for the right ureter above on the linea innominata and trace the same downward.

When the ureter is found in its usual position it is followed up to the parametrium. Difficulties are seldom encountered. The cellular tissue surrounding the ureter can be separated either with anatomical forceps or with scissors.

In order to get to the vesical portion of the ureter easily, liberate the parametrium as well as the uterine vessels and go about it in this way: The index-finger is forced along the ureter through the parametrium until the tip of the finger becomes visible near the bladder if the latter organ has been properly liberated from the uterus. The index-finger is now under the tissues of the parametrium in which are also the uterine vessels, clamps can now be applied to these vessels and leisurely tied off with either ligature or needle. The advantage of this maneuver is that the ureter is not injured, as the index-finger acts as a protection. As a rule it is easy to force the index-finger under the parametrium, but occasionally the uterine vein is ruptured, an accident that is of no great moment; only when the parametrium is invaded by carcinomatous infiltration is there difficulty encountered in forcing the finger through. In these cases (as in 270, 308, 225, 375) we would not follow this technic. In order to force the index-finger properly under the parametrium it is of importance that the ureter be clearly exposed as it enters this region; once the cleavage is recognized the index-finger slips through the space quite readily.

\* Clark, Howard Kelly and others.



After the parametrium is separated the vesical part of the ureter is easily reached, either by a few snips of the scissors or a little teasing of tissues; and now the liberation of the bladder itself becomes comparatively an easy matter.

In advanced cases, the liberation of the vesical part of the ureter becomes very difficult and in a few instances it has to be actually dug out. In the beginning we did not expect in these advanced cases that the ureter would remain free from carcinoma and we often deliberated on the advisability of resection, but the histological investigation of such ureters taught us the extraordinary immunity these organs have against carcinomatous invasion of their tissues, a fact which many authors have confirmed, such as Offergeld and Weibel, and the future further corroborated this as we can show brilliant results even in very advanced cases (15, 22, 137, 183, 204, 233, 262).

In six cases we did a resection of the ureters (23, 83, 93, 297, 303, 494) but even in these few cases the resection was not always necessary. In case 303, where the vesical part was finally dug out the microscope showed in one place where the resected portion looked very suspicious, that the ureteral wall was not invaded by the tumor. The same was true of case 297 where the ureter was firmly fixed. We finally liberated it but resected it because we were afraid of necrosis. The microscope in this case showed the carcinoma close to the ureter and causing its deformity but yet not invading its wall.

In cases 23 and 86 the microscope showed that the carcinoma had not invaded the ureter. Only in case 93 was the resection absolutely unavoidable; here the liberation was impossible and the microscope showed that the carcinoma had actually invaded the ureteral wall (Fig. 4).

Our view in reference to "ureter resection" is the same as that of Mackenrodt, who finds that it is seldom necessary to resect the ureter and in cases where it is done it has proven superfluous. Franz is of the same opinion. He did fifteen resections in 145 operations and found that in many of these it was superfluous. Krönig and Wendel find the difficult, time-consuming and often bloody digging out of these ureters, from the carcinomatous bed, inadvisable. Latzke would rather resect a ureter than dig it out of the carcinomatous bed. Döderlein is of the opinion that it is better to resect a ureter than to dig it out and in one case he went so far as not only to resect the ureter, but to remove the kidney on the same side.



While we have insisted upon the technic of ureter exposure, it is seldom that we have injured the ureters, this accident only occurring in eleven cases. In three of these (Nos. 71, 265, 440), the injury was not a complete severance of the ureter, but a longitudinal splitting, which occurred while the cellular tissue was pushed aside with the instrument; it was immediately repaired with three stitches which closed the wound completely. In one of these cases (440) there was established a uretero-vaginal fistula, which closed spontaneously, which, I think, proves that the fistula was not due to the splitting on the ureter. In a subsequent case (5) the right ureter was caught in a ligature used to repair a tear in the bladder itself.

In seven cases there was complete severance of the ureters; in case 121 there were two ureters on the left side; after one of the ureters was exposed the other was injured, as its presence was not suspected. We found double ureters four times in 500 operations; in case 16 it was double on both sides; in cases 121, 174, 306, on the left side, and in cases 142, 241, 398, it was on the right side. The case here reported was the only time where a double ureter was injured because we did not know of its presence. In case 65 the ureter was searched for deep in the pelvis by the uterine vessels. At the bladder it was thoroughly exposed, but the pelvic portion was unprepared and when the left peritoneal leaf of Douglas' pouch was split, the ureter was injured. In case 192 the index-finger in the parametrium did not thoroughly protect the ureter, so that when the uterine artery was tied the ureter was severed with the tied tissue. In case 280, the indexfinger technic was not used at all. In case 436 the right ureter was severed high up; we had to deal with a tremendous pyosalpinx which was liberated with the greatest difficulty and when the ligamentum infundibulopelvicum was ligated the ureter was caught with it and severed. In case 271 the injury to the ureter occurred in a case that was very firmly fixed. In separating the vesical part from the uterus the ureter was torn. In case 93 the operation was a very difficult and tiresome one.

Our aim in dealing with injured ureters (six resections and accidental injuries) is always to reestablish their continuity; for this reason, we implanted the ureter in the bladder in eleven cases (23, 65, 86, 93, both sides; 192, 271, 279, 280, 303, 494). The ureter implantation can in no way be blamed for the deaths occurring during operation. Only in case 93 did the implantation of the ureter fail; in this case the ureter was severed high up and as

a result of the tension it was torn from the bladder. In the other cases the implanted ureters all appeared to heal (65, 86, 271, 279, 280, 303) even in those cases where the healing was interrupted by the death of the patient (Nos. 23 and 93 left, 192 and 494).

In two cases (121 and 436) the separation of the ureters was so high up that the implantation into the bladder did not come into the question at all. In one case we implanted the severed branch of the double ureter into its fellow and four days later the autopsy showed that the ureter was healing normally. In the other case (436) the upper portion of the ureter was invaginated into the lower portion when collapse occurred, so we were satisfied with only a few stitches.

While the ureters are rarely injured during the operation, complications relative to the ureters often occur.

The production of fistulæ may be considered first. This took place in thirty-two instances. In sixteen cases it was on the left side, and in eleven cases on the right side, and in five cases on both sides. In all of these cases a ureterovaginal fistula resulted (26, 33, 51, 85, 133, 137, 148, 169, 234, 314, 347, 406, 40, 41, 465, 474, left side; 64, 176, 178, 188, 219, 276, 306, 338, 390, 407, 475, right side; 17, 36, 53, 241, 325, both sides).

The manner in which ureterovaginal fistulæ occur depends upon whether urine finds its way at once into the vagina or not. In most of our cases of ureterovaginal fistulæ we were not aware of the fact that anything had occurred until the patients complained that they were continually wet. However, in those cases where the urine did not appear in the vagina at once there were all sorts of symptoms of urinary retention.

In case 17 there was a continual temperature for fourteen days when a vaginal examination disclosed a soft fluctuating mass which was broken into by the finger and a large amount of foul odorous urine with pus was evacuated, when the temperature immediately fell. In case 169 there was also a temperature for nine days; when examined the finger broke through into the peritoneal space and a large amount of odorous urine was evacuated. In case 176 there was high temperature for two days. It was found that an abscess had developed in the subperitoneal space and upon enlargement of the opening considerable urine escaped. In case 178 the same thing occurred. In case 407 after considerable fever, a painful mass appeared in the ileocecal region which on the sixteenth day was incised parallel with Poupart's ligament and there escaped pus and urine from the incision. Three

days later, on account of a kink in the ureter, the result of a ligature, necrosis had occurred and the patient died of peritonitis.

In some cases where severe cystitis was present together with the fistula and cystoscopic examination was made according to the method of Volcker and Josef with the indigo-carmin method it was found that the mouth of the injured ureter was inactive, while the ostium of the uninjured ureter had the known rhythmic play of a normal ureter. In a few cases the mouth of the injured ureter showed feeble action of the ureter, a sign that in spite of the fistula a small part of the urine found its way to the bladder by the natural channel. If attempt was made to catheterize the injured ureter one succeeded in inserting the catheter from 3 1/2 to 4 centimeters, that is to say, the fistula formation caused an obstruction to the passage of the catheter, which obstruction was usually in the pelvic portion of the ureter. Only in one case was the fistula high up (case 188) where the catheter entered 8 centimeters. In a very few cases the catheter could be introduced beyond the obstruction after several weeks of time, whereupon in almost all cases very rapid drops of urine would appear as if the obstruction caused a dilatation and urine retention beyond this point.

In most of the cases of ureterovaginal fistula the urine appeared only from the seventeenth to the nineteenth day after operation; in one case, 176, it appeared on the twenty-first day and in case 309 on the thirtieth day.

It is to be observed that in fifteen cases the ureterovaginal fistula closed spontaneously (53, 137, 169, 176, 219, 234, 276, 306, 314, 325, 338, 347, 406, 440, 465). Among these were cases where there was also subperitoneal pus (169-176). The amount of urine from the vagina becomes less and less and finally ceases while the cystoscope shows an increased amount of urine reaching the bladder. In no case, as Weibel has observed,\* has the injured ureter ever closed, but its continuity was invariably re-established, which was also shown by the fact that the catheter could be introduced again through the ureter. Only a slight weakening of the urine stream on the injured side is to be observed. But never does stenosis occur so that a hydronephrosis develops, even years afterwards no sign of stenosis can be made out. It is self-evident that the spontaneous closure of these fistulæ takes considerable time. As Weibel has observed, only in one case did

\* *Zeitschr. f. Geb. u. Gyn.*, Bd. lxii.



it occur that the fistula closed in two weeks. As a rule it takes from six to seven weeks and in two cases only between the third and fourth month did healing occur. Sometimes the healing took place in stages; it would heal and break out again and this would occur several times.

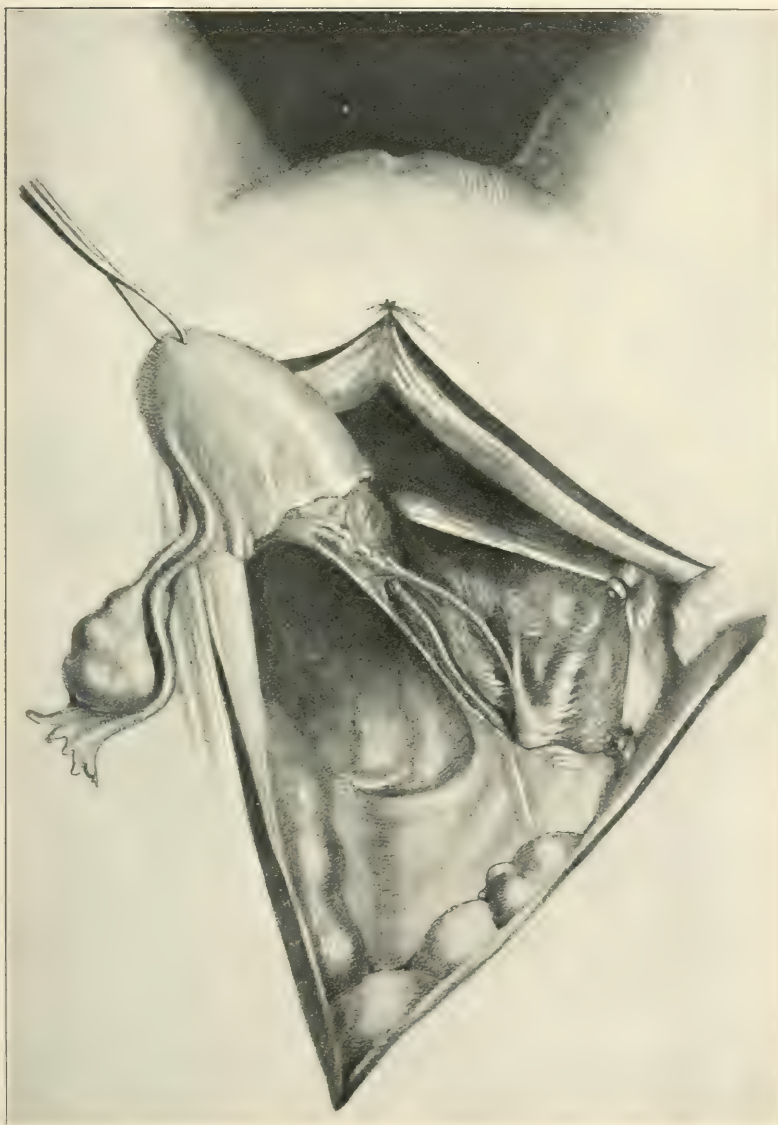
In all cases where the closure of fistulæ takes a long time there is danger of pyelitis and pyelonephritis from infection. In cases (36-133) where death occurred about a month after operation autopsy showed the presence of a pyelonephritis. In three cases where death occurred, after a shorter interval, autopsy showed the presence of pyelitis (178, 241, 474).

In case 178 where a right-sided ureteral fistula opened the tenth day, three and one-third weeks after operation there was a recurrence of the carcinoma. She was submitted to a second operation nine and one-half months later and it was found impossible to remove the mass, as the true pelvis was filled with the growth. In this case also there was present a cystitis and a pyelonephritis.

The same was the case with 474.

In case 241 a double ureterovaginal fistula appeared on the seventh day after operation. After a while more and more urine came from the bladder (it having been empty for one and one-half months), showing a tendency to spontaneous closure. Had the patient waited longer at least one of the fistulæ would, perhaps, have closed by itself, but she was very anxious to be free of the annoyance of the constant loss of urine, and, as we feared a double pyelonephritis, both ureters were implanted into the bladder by laparotomy three and one-half months later. The implantation of the left ureter was done under difficulties and when completed it was considerably stretched. Five weeks after the operation urine appeared in the laparotomy wound. The cystoscope showed that both ureters were successfully implanted in the bladder a little above the normal ureter openings. From the right side the urine appeared regularly, shown by the indigo-carmin test; from the left side no urine appeared; both mouths of the ureters showed a regular outline; there was no motion to be observed, which is usually the case. The diagnosis showed then that we had a left-sided ureteroabdominal fistula. No further attempt was made to have this fistula heal, as there was a reoccurrence of the cancer on the left side of the pelvis. The patient died six months after operation and postmortem (Prof. Schlagenhauser) showed that the right ureter was firmly im-



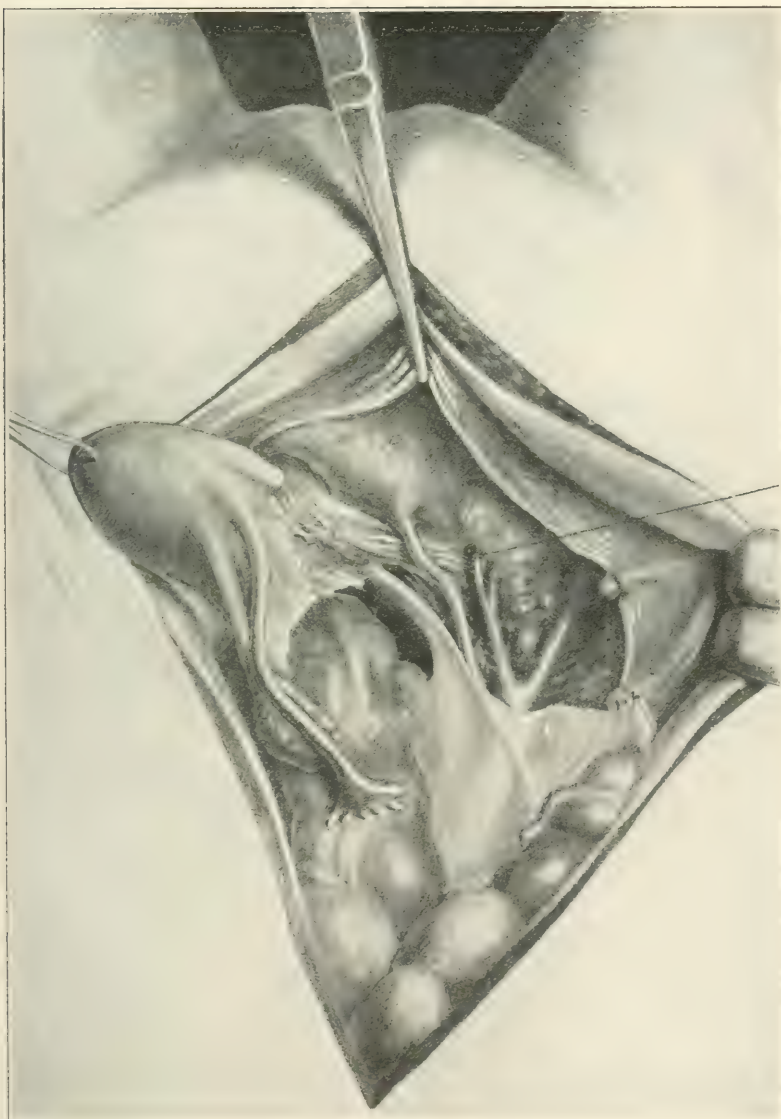




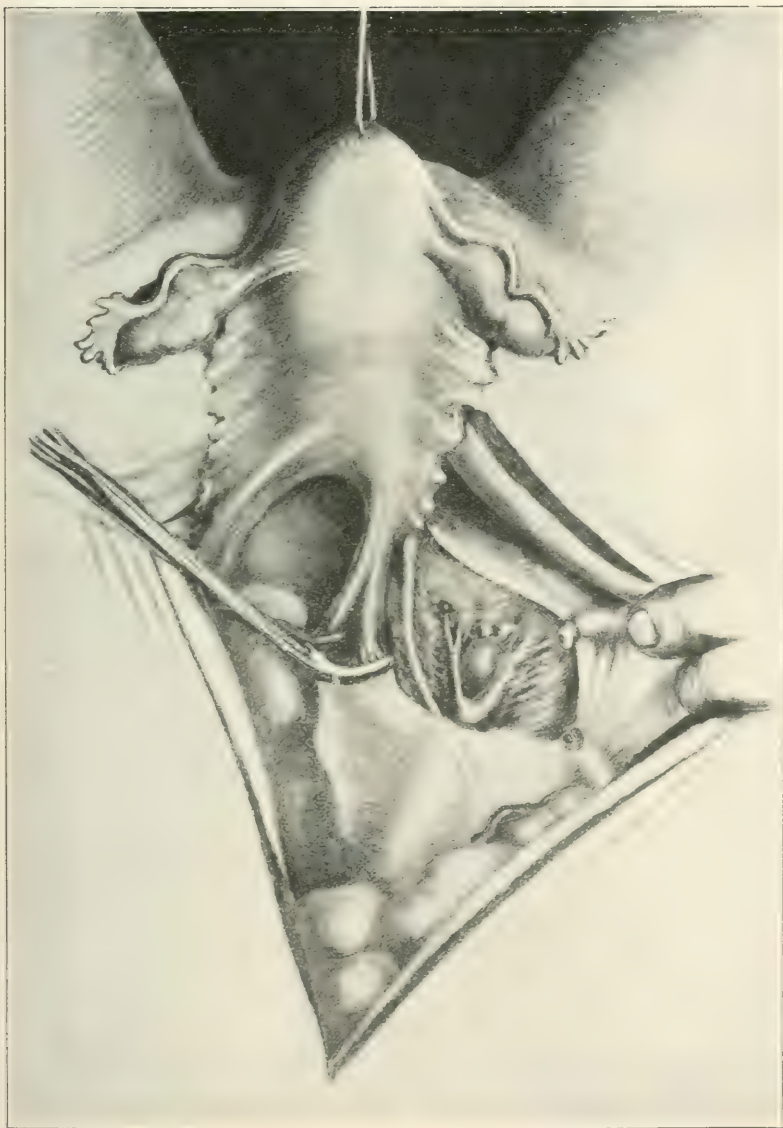






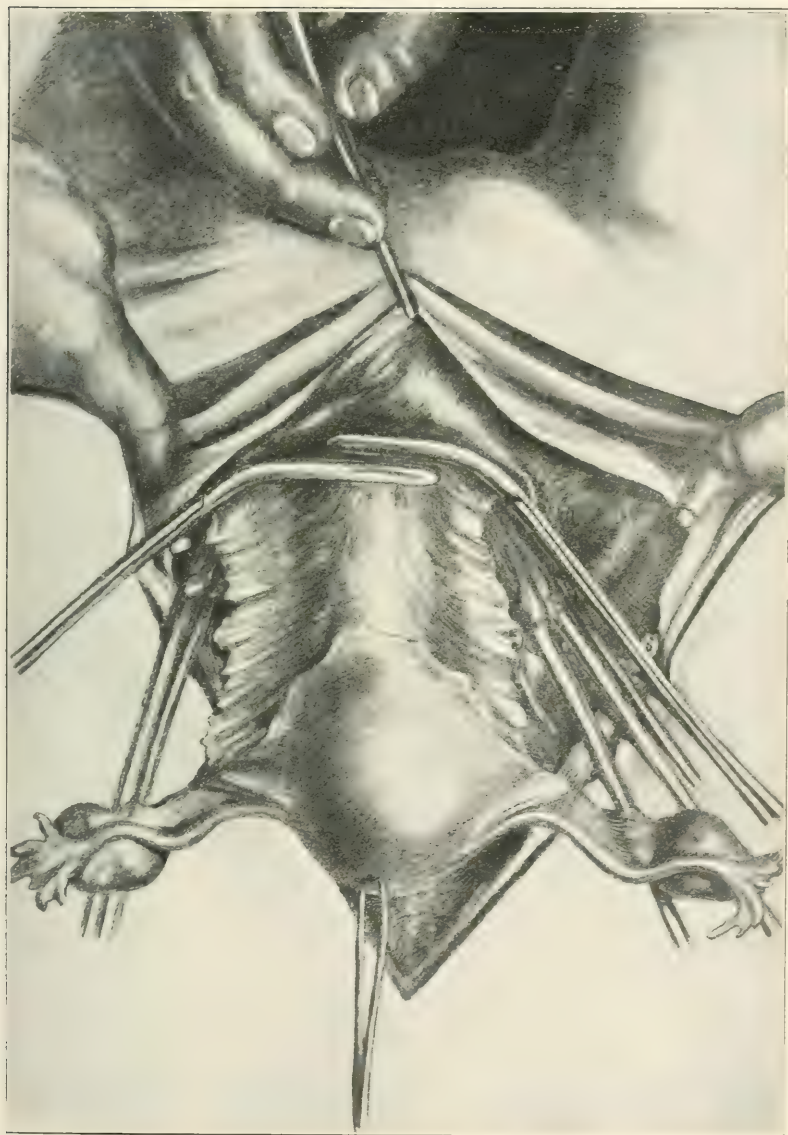




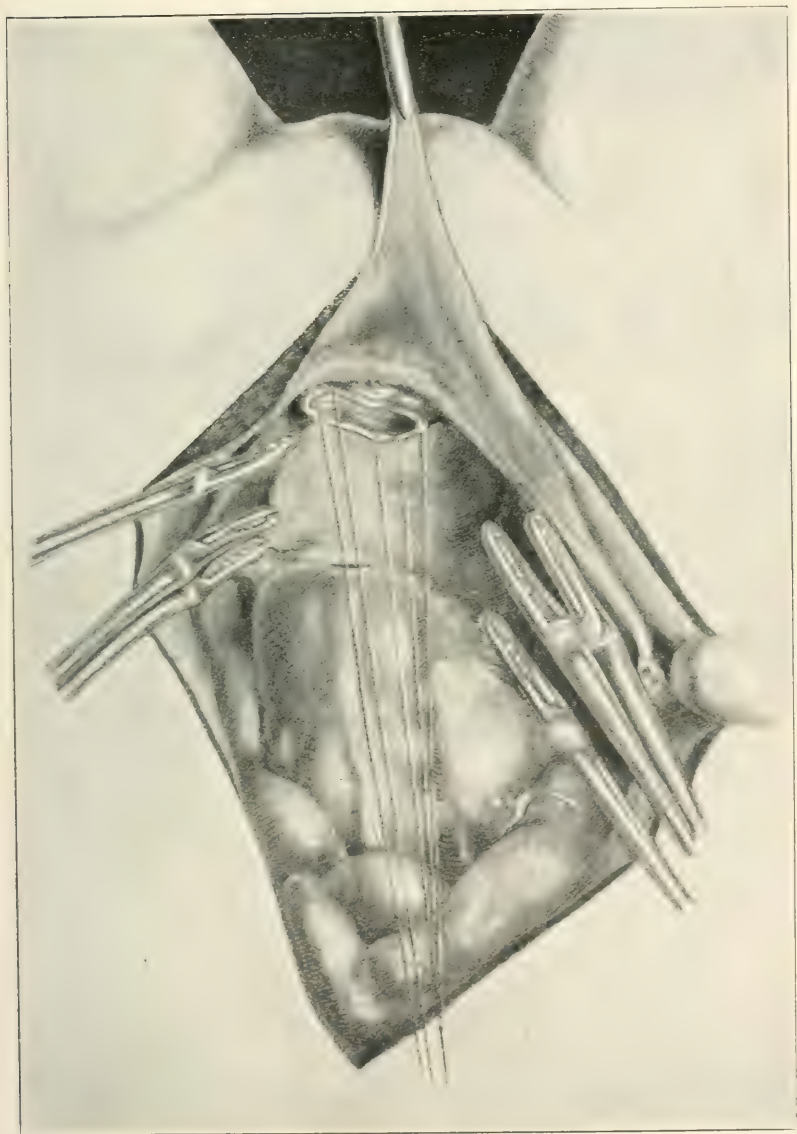
















planted in the bladder, but right ureter was double, each one leading to a kidney. The doubling of the ureter was not observed during the operation. The left ureter stump was necrosed so that the urine was behind the bladder in a hollow space in the pelvis from which there was a communication from the laparotomy wound. The left kidney was much dilated and filled with pus.

In case 188 the section showed pyelonephritis and dilatation of the pelvis of the right kidney as well as dilatation of the ureter and yet the patient lived for three years after the operation.

After the appearance of the ureteral fistula on the right side on the tenth day after operation, a vaginal examination revealed, on the side where the fistula was located, a large space filled with coagulated blood and catheterization of the ureter showed that at 8 centimeters the catheter was arrested; a hydronephrosis was suspected and an operation for its removal was decided upon four months after the operation. This operation would have been done had not the urine shown albumin from the other kidney and the Phloridzin test was negative. The implantation of the ureter did not appear wise as she was suffering also with a severe cystitis. In the meantime the fistula closed repeatedly and at one time it remained closed for five weeks. Three years after operation the patient died and autopsy showed the presence of a pyelonephritis and dilatation on the right side. The ureter was also dilated while the left kidney only showed hypertrophy. There was no recurrence of the cancer.

In cases 17, 26, 64, 390 there were stormy symptoms of pyelonephritis. The affected kidneys were extirpated and the removed organs showed that the nephrectomy was justifiable. Nevertheless it is to be observed that one should be guarded in this matter and time should be given for observation in these cases. Aside from the fact that frequent spontaneous healing occurs in these ureteral fistulæ the appearance of irreparable pyelonephritis is not so frequent and the fear of such an infection should not lead us to an early extirpation of the kidney. At least in cases 33, 51, 85, 148 the extirpated kidney did not show a pyelonephritis although a considerable temperature rise was present. In these cases one could have waited longer and given the fistula a chance to close spontaneously. (In case 33 the kidney was removed two months after the operation and in the other three cases about a month after operation.)

It is our experience that in all cases where the ureteral fistula

does not heal in reasonable time there is great danger of an infection of the kidney. We agree with Kromer\* that the danger of an ascending infection makes the prognosis very gloomy.

There is no doubt in our minds that the cause of ureteral fistula is necrosis of the walls of the ureter from interference with its nutrition, brought about by isolation of the ureter itself. As to the manner in which isolation of the ureter leads to necrosis, opinions differ. The preservation of the vessels leading to the ureters is only of minor importance† and it is of more importance to preserve the sheath of the ureter and in that way leave the vessels undisturbed.‡ Stöckel\*\* says that the principal cause of ureter necrosis is to be found in the fact that the ureter becomes kinked during the operation; as a result of this kinking urine collects above the bend of the organ and the injured ureter cannot withstand the pressure. Besides this infection of the ureteral wall comes into play. This kinking of the ureter is principally brought about by drainage of the subperitoneal space. Drainage tubes and gauze, according to the opinions of Stöckel and Bumm, isolate the ureter from its surroundings, press on it and in that way the kinking of the ureter takes place. Franz†† says that the principal cause of ureter necrosis, besides drainage, is injury, although not discoverable during the operation. Veit‡‡ lays great stress upon the subperitoneal secretion as the cause of necrosis. He says not only is the nutrition of the ureter disturbed by its isolation, but finds itself in a puddle of liquid swarming with products of putrefaction which reacts unfavorably upon its nutrition.

The explanation that the above-mentioned conditions result from drainage is hardly tenable. If the drainage is placed in the subperitoneal space in such a way that it does not completely fill the pelvis but is packed loosely and hardly comes in contact with the ureters, then such a consequence is not to be expected. We placed drainage in the subperitoneal space in all of our 500 cases and yet we only had 6.4 per cent. of ureter necrosis, while Franz from 145 operations notes 4.8 per cent. The difference is not great enough to make us believe that the condition is the result of drainage.

As far as the superficial injuries to the ureters is concerned,

\* *Zeitschr. f. Gyn. Urol.*, 1.

† Art. Ureterica Feitels, *Zeitsch. f. Geb. u. Gyn.*, Bd. xlv, H. 2.

‡ Sampson, *Johns Hopkins Bulletin*, Feb., 1904.

\*\* *Kongr. des. deutsch. Ges. f. Gyn. Kiel.*, 1905.

†† *Zeitschr. f. Gyn. Urol.*, Bd. i, 1909.

‡‡ *Prakt. Ergebn.*, ii, 2, p. 317.

there is no doubt that this plays an important part in the necrosis, particularly when the ureteral sheath is disturbed. Neither is it to be denied that in cases where the isolation of the vesical part is difficult a thinning out of the ureteral wall can occur. The latter condition occurs in our technic very seldom and we cannot imagine that if it does occur we should not have observed it. As soon as we observe that the wall of the ureter had been injured we at once practise resection.

As far as this is concerned we have observed ureter necrosis in many cases where no great difficulty was experienced in isolating the ureter and where we are sure that no injury occurred at the time of the operation (as in cases 64, 133, 148, 169, 178, 188, 234, 306, 338, 347, 390, 406). On the other hand, we have also observed cases where the ureter was so firmly implanted, particularly its vesical portion, that we had to dig it out step by step and yet no fistula resulted (cases 56, 90, 131, 142, 144, 154, 183, 200, 204, 205, 209, 210, 228, 233, 246, 247, 260, 261, 262, 281, 304, 308, 328, 330, 342, 350, 373, 379, 380, 387, 388, 398, 422, 433, 437, 479, 486, 490, 491, 492, 495).

Our own studies and experiments to determine the cause of ureter necrosis in the extended abdominal operations have been futile. We aim to avoid injury to the ureter and preserve its sheath as far as possible; we avoid squeezing, tearing or isolating them too much from their surroundings. We have adopted also (from case 227 on), the method of Bumm\* which consists in opening up the two leaves of the ligamentum latum, in such a way that the ureter remains on the posterior leaf. We have also followed Aman† who tries to fold the vesical part of the ureter into the bladder tissue and cover the upper portions of the exposed ureter with the peritoneum in a way so as to unite the lateral portions of the peritoneum with the parts from the stump of the ureters. We are also particular in tying our ligatures not to have knots in a position where they could press on the ureter, which occurs when one attempts to tie large masses of tissue in one ligature.

We cannot say whether any of these methods have a particular advantage. In the first 100 cases we had eight necroses; in the second 100 cases we had seven; in the third 100 we had four; in the fourth 100 we had seven; in the fifth 100 cases we had six.

\* *Zeitschr. f. Geb. u. Gyn.*, Bd. lxi, H. 1. p. 208.

† *Zeitschr. f. Geb. u. Gyn.*, Bd. lxi.

As the matter stands to-day we must be satisfied that in a certain number of cases ureter necrosis will occur. In very advanced cases it is inevitable that during the operation the ureter must be isolated and so it is stripped of its sheath with blood-vessels and thereby suffers injury.

In reference to ureteral fistulæ we first wait for spontaneous healing; this we aid by local cleanliness; we use nitrate of silver and tincture of iodine. Chills and fever we have not observed, in spite of what Kromer\* says. If no spontaneous healing occurs within four months and no diminution of the urine stream occurs we then step in with operative interference. First we attempt to implant the ureter in the bladder, but if this is not feasible or where the kidney on the corresponding side has become greatly altered in function, nothing remains but a nephrectomy.

Extraordinary conditions arise when there are fistulæ on both sides. We have experienced this as already mentioned in five cases (17, 36, 53, 241 and 325). In case 17 the left ureter became fistulous four months after the operation, a nephrectomy having been performed on account of a fistulous condition of the right ureter five weeks after the operation. Autopsy showed that the fistulous tract in the ureter resulted from a necrosis of the carcinoma which had invaded the wall of the ureter. In case 36 death occurred as a result of pyelonephritis. In cases 53, 325 spontaneous recovery occurred. In case 241 we did a double implantation of the ureter three months after operation but only the right side held. On the left side the fistula remained. Very soon afterward the cancer recurred and the patient died. In a similar case Sellheim† implanted the ureters into the bladder by vaginal operation.

It is to be observed that in our radical abdominal operation we have frequently experienced cases of kidney infection without a ureteral fistula, but the resulting pyelitis was often of a milder type. Nevertheless it not infrequently was the cause of intermittent temperature rise, perhaps unfavorable influencing the course of these cases. It is very likely that the function of the ureters comes into play in these cases. It is very possible, as it is with the bladder, that on account of the isolation of the ureter from its surroundings and the resulting nutritional disturbances a predisposition to infection is created. Stockel thinks that bacteria are always present in the subperitoneal space and if the vitality of the bladder is interfered with cystitis may result

\* *Zeitschr. f. gyn. Urol.* 1, p. 263.

† *Hegars Beitr.*, Bd. ix, H. 3.



from the invasion of the bacteria, and a ureteritis results from the same cause. It is to be observed that the peristalsis of the ureters, which under normal conditions favors the egress of urine from them, is markedly interfered with in the cases of extended abdominal operation, as here the ureter does not lie in its loose elastic bed, but in a firmly fixed space and in this way infection is favored in its walls. It is also possible that on account of insufficient sphincter action, urine and bacteria can reach the ureters from the bladder.

It has been our experience that in cases of pyelitis we have obtained excellent results from injections of silver nitrate and protargol into the pelvis of the kidney by means of ureteral catheters.

*The Bladder.*—The extensive loosening of the bladder which is necessary in the radical operation cannot be carried out in one step. We first loosen the bladder as in the ordinary abdominal operation for extirpation of the uterus, and further free the organ after the preparation of the vesical part of the ureters has been carried out. The sides of the bladder are more easily freed if the vesical portions of both ureters have been cleared first. The loosening of the base of the bladder meets with little difficulty although here the cellular tissue is firmer. The liberation of the bladder is done in stages, first the middle portion is loosened, then the pelvic portions of the ureters; then from the ureters on the sides of the bladder; and finally the base of the organ is separated from the vagina.

For the proper freeing of the bladder, we use scissors slightly bent and with rounded points. Pushing down with the finger is apt to cause bleeding and there is greater risk of injuring the bladder.

In ordinary cases, that is to say, where the carcinoma has not invaded the bladder wall, the loosening of the bladder is easy, if this method is followed. In this class of cases we have injured the bladder only four times (26, 33, 41, 197). Such defects were at once repaired with a few stitches and primary union occurred in every case.

It is an entirely different matter when the bladder has become fixed by the cancer; it often happens then that in liberating the organ pieces of muscular tissue of the bladder wall remain with the carcinomatous uterus. As a result a thinning of the bladder wall results; in some case only the mucous membrane remaining unopened. It often happens that one breaks into the bladder

repeatedly in the attempt to liberate these fixed organs. In cases of this nature we avail ourselves of the method of loosening the bladder from the "sides of the ureters." We do not loosen the middle part of the bladder, but work our way from the ureters under the organ and thus loosen the fixed portion of the bladder. In this way we often avoid breaking into the bladder and, if a resection of the organ is called for, it can be done with more exactness and with more sparing of the tissues. We were obliged to loosen the bladder from the ureter's side in ten cases (185, 186, 225, 310, 326, 422, 470, 472, 485, 492).

Bladder injuries, as a result of fixation, occurred in forty-five cases (5, 11, 22, 28, 86, 92, 95, 100, 101, 103, 131, 135, 138, 154, 155, 176, 184, 194, 197, 200, 233, 241, 252, 261, 262, 284, 308, 310, 350, 380, 387, 388, 397, 404, 419, 422, 430, 437, 445, 468, 470, 472, 485, 486, 491). In all of these cases parts of the fixed bladder wall had to be left on the uterus. In eighteen of these cases (592, 154, 184, 194, 200, 241, 261, 262, 284, 308, 387, 404, 419, 422, 437, 468, 470) the bladder was opened. In three cases (86, 252, 430) resection was done. In the twenty-one cases where bladder was opened or resected the injury was immediately repaired by stitching; but only in eleven cases did primary union take place (92, 154, 194, 241, 262, 284, 308, 422, 430, 468, 470). In seven cases the sutures did not hold (86, 200, 252, 261, 387, 404, 437) and a vesicovaginal fistula resulted. Three cases (5, 184, 419) did not survive the operation.

In the other twenty-four cases, where the bladder was not broken through, the injuries were often severe enough to result in vesicovaginal fistulæ. Six cases (11, 28, 100, 138, 197, 472) do not come under consideration as they did not survive the operation. Of the remaining eighteen, in nine cases (22, 95, 131, 135, 233, 350, 397, 483, 486) fistula resulted in consequence of necrosis of the injured part.

In advanced cases of carcinoma where the bladder becomes fixed, parts of its muscular structure have to remain on the tumor, which really amounts to a resection. Our experience shows that, even if the mucous membrane of the bladder remains uninjured, vesicovaginal fistulæ will occur in 50 per cent. of these cases, as a result of the thinning of the bladder wall. It is a question in our minds whether it were not better, under these conditions, to do a resection at once, which we did in three cases (86, 252, 430) and which was done by Mackenrodt.\*

\* *Zeitschr. f. Geb. u. Gyn.*, Bd. liv, p. 577.

However as vesicovaginal fistulæ occurred also after resection (86, 252) we are in the habit of covering over the thinned-out portion of the bladder with the more solid structure of the organ, a reef is taken in the bladder and the injured portion is tucked in (445). If a resection is undertaken it is of importance to remove the thinned-out parts in order to get primary union.

Out of the sixteen cases of vesicovaginal fistulæ which followed loosening of fixed organs (22, 86, 95, 131, 135, 200, 233, 252, 261, 350, 387, 397, 404, 437, 485, 486) in one case (200) spontaneous healing occurred after douchings. In case 261 the fistula closed, but reopened again. In fifteen cases operative interference was called for the closure of the fistulæ, with final success in all cases, although some had to be closed twice and some even three times. Freshening the surface and suturing was all that was necessary, although sometimes tension incisions were called for. Occlusion of the vagina was never necessary, contrary to Latzko.

Franz\* is of the opinion that necrosis of the bladder wall is favored by drainage with gauze, which is allowed to rest against the bladder for several days. This is not born out by his own cases as he had as many cases of necrosis as we had, although he only allows the gauze to remain for twenty hours.

The loosening up of the bladder in the perfected abdominal operation is far greater than in the ordinary abdominal operation as in some cases the loosening reaches down to the internal orifice of the urethra, and besides the bladder wall becomes thinned out in places so that the resulting postoperative disturbances are of considerable consequence. Following the operation there is more or less of a paretic condition present, which often lasts up to the day of rising from bed and in some cases even longer. The patient cannot empty her bladder completely, so that residual urine is always present, and only after some weeks does the complete function of the bladder return.

From this paretic state of the bladder cystitis results. The greatest caution during catheterization and the systematic irrigation of the bladder with disinfectants and astringents after each catheterization does not prevent the occurrence of a cystitis. Even in cases where no catheter was used as the bladder function was not disturbed, cystitis invariably occurred.

It is certainly positive that this postoperative cystitis is not caused by infection during catheterization. The bacteria reach the bladder either through the urethra or else from the sub-

\* *Zeitschr. f. gyn. Urol.*, 1909, Bd. i.

peritoneal space, penetrating the loosened bladder wall (Stockel). At all events cystitis is favored by the paretic condition of its walls, by the disturbance of its nutrition, by the circulatory disturbance as a result of the loosening of the organ from its natural bed, and expresses itself by hemorrhages, edema, and epithelial shedding.

In order to diminish the postoperative bladder disturbances Kronig\* recommended that at the end of the operation the raw surfaces of the bladder be stitched over so as to make this area smaller and at the same time cover this surface with peritoneum from the anterior wall of the bladder, so as to leave no raw surface. We ourselves as well as Franz† saw no improvement after that method, so we abandoned it and make no use of same. We look upon these bladder disturbances in radical operations as an unavoidable evil and carefully look after these organs so as to prevent a severe cystitis as far as possible. Systematic catheterization and daily irrigation with a disinfectant, beginning on the first day after operation, has given us good results. Franz‡ speaks well of the retained catheter; Hannes¶ on the other hand speaks against its use.

VI. *The Rectum.*—While in the ordinary abdominal operation for uterine extirpation the rectum seldom comes in consideration, in the extended abdominal operation, on account of the need of the formation of a vaginal cuff, the loosening of the rectum cannot be excluded. We are in the habit of going about it in this way; we incise the peritoneum at the junction of the fixed and loose portion of the rectum, when it becomes easy to bore your finger into the cellular tissue of the rectovaginal septum and thus isolate the rectum from the vaginal wall.

In two cases, where the rectum was not sufficiently loosened the anterior wall was caught in the vaginal clamp and when severed the rectum was opened (35, 52). Immediate suturing resulted in primary union in both cases. Schieb reports a similar case.\*\*

As a rule the rectum is easily loosened, but as in the case of the bladder, when the carcinomatous process has advanced the loosening may be very difficult (78, 184, 232, 233, 235, 260, 339, 347, 349, 350, 373, 378, 379, 381, 394, 438, 476). In a few

\* *Monatschr. f. Geb. u. Gyn.*, Bd. xv, H. 6.

† *Zeitschr. f. gyn. Urol.*, 1909, Bd. i.

‡ l. c. u. *Arch. f. Gyn.*, Bd. xci, p. 607.

¶ *Zeitschr. f. Geb. u. Gyn.*, Bd. lxxii.

\*\* *Arch. f. Gyn.*, Bd. lxxxvii, p. 29.



cases the rectum was opened (235, 339, 347). Immediate suturing brought primary union in part of the cases (339, 347) but we also had fistula formation in the rectum, which, however, have a great tendency to heal spontaneously (235). Contrary to the bladder the rectum seldom suffers with necrosis and fistula formation at some later date. We have no such instance to report, although Scheib mentions one case.

*VII. The Regional Lymph-Glands.*—In reference to the regional lymph glands we hold the same views as formerly, that we remove them only when they are found to be enlarged.

This question has been attacked\* from various points. Against the demand that the principal thing is to remove all of the lymphatic system is the fact that first of all this could not be accomplished and second, it is not necessary to do so. Admitted even that in some few cases carcinomatases may be found in glands slightly enlarged, say to the size of a pea, yet it is a fact that in the spindle-shaped glands normally found in the pelvis, and becoming swollen with chain-like formation no carcinoma is ever found.

In order to be sure that no enlarged regional lymph glands are overlooked if present, it is not sufficient to rely only on palpation of the various regions. It is necessary to split the peritoneum, expose the vessels so that one can palpate between and under these structures, and be able to pick up between the fingers the cellular as well as fatty structures. Only in this way can one avoid leaving behind enlarged lymph glands.

In the beginning it was our aim to loosen the lymph glands and include them during the removal of the parametrium; this works well in theory, and certain operators—for instance Latzko—still adhere to such a practice. Theoretically there is an advantage gained by this method, as during the removal of the glands the lymph vessels are also included. Practice, however, has proven that these lymph nodes tear away during the operative manipulation, so we arrived at the practice of extirpating the lymph nodes at the close of the operation. Only in those advanced cases of carcinoma where inspection and palpation show the lymph glands enlarged and fixed, do we begin the operation with the removal of the lymph glands first and if we find it impossible to extirpate them the operation is abandoned.

\* Mackenrodt, *Kongr. zur Guessen*, p. 140, Rosthorn u. a.

Histological investigations have shown that carcinoma is seldom found in the connecting lymph vessels.\*

The extirpation of the lymph glands is not difficult in the great majority of cases. After the peritoneum is split open sufficiently in an upward direction, the cellular tissue is easily invaded by the finger, the vessels are loosened all around and the presence of enlarged glands are determined. In case the cellular tissue is tough, it may be necessary to divide it with scissors or forceps. The palpating finger pushed under and between the vessels and deep into the obturator foramen finds the enlarged glands very readily.

In searching for enlarged glands we proceed in the following order: First we search along the common iliac, then we follow along the external iliac as far as the internal abdominal ring. In order to reach the triangle between external iliac and hypogastric, the index-finger is then pushed into the obturator foramen, and it is to be observed that when enlarged glands are found in this space the obturator nerve is freely exposed. In some cases this nerve is entirely surrounded by diseased glands, but in almost all cases the nerve can be freed from them. Only in one case did we have to resect it (19). We end up the search in the sacral region.

One must practice the greatest caution in cases where the carcinomatous glands have become united with the iliac vessels (19, 63, 116, 147, 176, 178, 197, 266, 372, 399, 418, 425, 445, 465, 478). Injury to the iliac veins is a very disagreeable occurrence. In case 20 after the patient had already sat up a hemorrhage occurred from the vena hypogastrica, which was injured during the search for enlarged lymph glands. In case 492 the external iliac vein had to be tied off owing to an injury to its wall, which resulted in a severe edema of the leg. In a few other cases vessels had to be resected because of the fact that the carcinomatous glands could not be separated; in case 28 the external iliac vein was resected; in 109 the hypogastric artery and in 413 the hypogastric artery and vein had to be resected. In two cases (117, 393) the carcinomatous gland conglomeration had to be left in situ, and in case 168 we succeeded in removing the same, but suspicious pieces of tissue remained on the vessels.

In cases where large numbers of glands are cleared away the blood-vessels appear as if isolated and in places entirely uncovered,

\* Kindrat, Ochlecker, Rosthorn, Mackenrodt and others.

a sign that the removed glands were situated under the vessels as well as on their sides.

For the complete extirpation of enlarged lymph glands Mackenrodt uses the transverse laparotomy incision. If the ordinary laparotomy incision through the linea alba is carried down to the symphysis pubis, one finds no difficulty in reaching even the glands deep in the obturator foramen and we never experience lack of space. Not even marked retraction of the laparotomy wound is necessary and the healing of our wounds was always better than in the transverse incisions.

*VIII. Narcosis.*—Although the narcosis is not a part of the operative technic it seems to us wise to speak of it in reference to the extended abdominal operation. The relatively large number of cardiac deaths in the first 200 cases forced us to shorten the time of narcosis as far as possible. For this purpose we proceeded from case 229 on to begin the narcosis after the excochleation and Paquelinization of the primary focus was accomplished. If the vagina is protected from burning by appropriate specula very little pain is experienced by the patient, and in that way we save from fifteen to twenty-five minutes of narcosis. The result of this measure was to reduce the number of cardiac deaths.

Later on we availed ourselves of the recommendation of Rich. Freund, from Veit's Clinic, to use spinal anesthesia in all those cardiac cases, where inhalation anesthesia might be harmful. We used spinal anesthesia in thirty-three cases (285, 287, 288, 289, 290, 301, 314, 317, 318, 320, 332, 335, 344, 345, 347, 349, 351, 361, 380, 393, 395, 401, 422, 441, 442, 447, 448, 449, 450, 457, 460, 470, 471). In the first nineteen cases we used *Stovain* (Billon) later tropococaine. In one case where stovain was used we had respiratory paralysis (332). In two cases (288, 289) the spinal anesthesia had to be supplemented by inhalation narcosis. In one case where tropococaine (0.06–0.10) was used we had total failure; in five cases partial failure to cause anesthesia.

On the whole we were greatly satisfied with Lumbar anesthesia in the extended abdominal operation, and we were impressed with the fact that with this measure we could undertake operation on cases that otherwise we would not risk for fear the patient could not stand the operation.

These are the principles by which we have been guided in our technic of the extended abdominal operation. When we describe

collectively our technic of the operation in a typical case it is as follows:

Immediately before the operation, and before the narcosis has begun, we prepare the carcinoma with a sharp curet and Paquelin and then pack the vagina full with sublimate gauze. The patient is put on the operating table and anesthesia is given. The abdomen is then opened through the linea alba with the pelvis elevated.

After liberating adhesions the fundus of the uterus is seized with traction forceps.

The operation is now actually begun with the loosening of the bladder in the median line. After this the infundibulopelvic ligament is ligated on one side and cut through, the two leaves of the broad ligament are then separated by pushing the finger between them. The anterior leaf is stripped up to the ligamentum rotundum, which is tied off and cut after the peritoneum is stripped off the bladder. The posterior leaf of the broad ligament is then stripped up and the ureter is searched for, when this is found it is laid bare and followed until it enters the parametrium (Plate 1). Now follows the maneuver of pushing the finger under the parametrium following the ureter (Plate 2). After the parametrium, with the uterine vessels, is hooked up by the index-finger, the vessels are tied off and severed, laying bare the vesical portion of the ureter which is then freed and followed up to the bladder, which is also loosened (Plate 3).

After dealing with the other side in a similar fashion, the loosening of the rectum is proceeded with. The best way to go about it, is to elevate the peritoneum of Douglas pouch by means of forceps to a point where the peritoneal junction is easily recognized. At this point the peritoneum is incised, which leads to the loose cellular tissue between the vagina and rectum. The rectum is now isolated and the peritoneal incision enlarged on either side so as to meet the peritoneal cut in the posterior leaf of the broad ligament.

Now comes the liberation of the parametrium from the pelvic floor under the protection of the parametrium clamps (Plate 4). Naturally the parametrium is spread out along the pelvic floor and one must not attempt to seize its entire length in one forceps. Beginning at the inner and posterior portion of the pelvis by the ligament uterosacral, step by step the vaginal portion is finally reached.

When everything is ready for opening the vagina, the sub-



limate gauze introduced before the operation, is removed and the vagina dried with sterile gauze. After another inspection to see that the vaginal tube is thoroughly isolated, and that the bladder, rectum and ureters are free, the opening of the vagina is proceeded with by clamping the vaginal tube (Plate 5). The vagina is again dried and then cut off under the clamps and the extirpation completed.

The vaginal veins are now sutured and the strings of sutures left long (Plate 6). These sutures control the bleeding which is at times quite considerable. As a rule the bleeding comes from the lateral portions of the paravaginal tissue, the long suture ends allow an easy introduction of iodoform drain into the vagina. The parametrium clamps are replaced by ligatures and all bleeding points controlled. Now comes the search for enlarged lymph glands. The iliac vessels are exposed, when the renewed bleeding must be carefully controlled. After the introduction of the iodoform gauze into the vagina from above, the peritoneal folds are stitched over the vagina and the laparotomy wound finally closed.

#### B. INDICATIONS FOR THE OPERATION.

From the beginning the extended abdominal operation has demonstrated that the entire surroundings of the diseased uterus are removable and so has advanced the indications for the operation. While with the vaginal operation infiltration of the parametrium and fixation of the uterus so that the organ could not be pulled down with bullet forceps was a contraindication, with our operation we can attack cases with parametrium infiltration and feel certain that fixed organs such as bladder, rectum and ureters can be loosened and the diseased uterus removed completely even in advanced cases of carcinoma.

For this reason we finally allowed ourselves to advance the indication for operation. Before the year 1898 at the Vienna Clinic\* fifteen operations were done out of 100 cases of uterine carcinoma, that presented themselves. With the aid of the extended abdominal operation, this number soon rose to 30 per cent.; with the advance of our experience and practice it rose to 50 per cent., and in the last two years it has been 61.9 per cent. The 500 cases herein reported were taken out of 1096 cases that presented themselves, fifty-five of these cases refused operation,

\* Waldstein, *Arch. f. Gyn.*, Bd. lxi, Heft 1, and Knauer, *Bertraz s. Gel. u. Gyn.*, Bd. v, Heft 2.

twenty-two were operated on vaginally, and 519 were too far advanced. This gives a total of nearly 50 per cent. of cases that are operable.

In reference to the indication for operation naturally the first thing that comes into consideration is the local condition. Examination, however, can show this only to a limited extent. Of course, if the entire pelvis is filled with hard masses, or if the vagina is changed into an unyielding tube down to the vulva, then there can be no doubt. If the disease is not so far advanced then under certain conditions it may be difficult to come to definite decision. The condition of the regional lymph glands cannot always be determined by an examination, even when made through the rectum. As we have already pointed out, with an open abdomen, with the peritoneum split open, enlarged lymph glands may escape one and palpation may fail to show carcinomatous infiltration of the peritoneum of the bladder or rectum. As far as the bladder is concerned the use of the cystoscope has not changed matters.\* Only Hannes and Schieb speak for the value of the cystoscope to determine if the bladder loosening during the operation will prove difficult or not. A prominent trigone is indicative that the carcinoma is near the bladder; that it has invaded the vesicovaginal septum; on the other hand a negative cystoscopic finding would show that no fear need to be entertained from bladder complications during the operation. As far as the parametrium is concerned, which can be palpated especially by a rectal examination, W. A. Freund has shown that stiff parametria may be free of carcinomatous infiltration, while soft and yielding noninfiltrated regions of the parametrium may contain carcinoma, a fact that has been confirmed by Kundrat and Pankow.

If a thorough examination does not lead to a definite decision whether the case is an operable one or not, one always can have recourse to an exploratory laparotomy. Frequently the findings at the time of operation are not what was expected after the examination. Often the operation succeeds better than it was hoped and the reverse may also be true, what seemed a favorable case at the time of examination may prove inoperable when the abdomen is opened. As it is impossible to determine by means of an examination the extent of the spread of the disease, one must

\* Fromme, *Monatsscher. f. Geb. u. Gyn.*, Bd. 27, Heft 2; Zangmeister, *Zeitschr. für Bed. u. Gyn.*, 55; Stockle, *Die Cystoskope des Gyn.*, Leipzig, 1904; Hannes, *Zeitschr. f. Geb. u. Gyn.*, Bd. lxii, Heft 2; Schantas, *Monographie, Schieb. arch. f. Gyn.*, Bd. lxxxvii, p. 11.

consider every operation for carcinoma of the uterus an exploratory laparotomy. Only after the abdomen is opened is it possible to say whether the operation can be carried through or not. A section gives one a chance to see the condition of the lymph glands, the ureters, the bladder, the rectum. The eye can see, the fingers can palpate, and if this is not sufficient the peritoneum may be opened up without the operation losing its explorative character. Even the preparation of the ureters, the loosening of the bladder or rectum does not prejudice matters as the incised peritoneum can be resutured and closed. This is an advantage over the vaginal method, where frequently one becomes aware of the uselessness of the procedure at a stage of the operation when no turning back is possible.

Next to the local condition the general condition of the patient is of great importance. The question is always this: Can the patient withstand the shock of the operation? With a well-nourished patient with good heart function, one can risk a more or less lengthy and complicated operation, while the same would not be the case with a patient with cachexia. Where the general condition of the patient is not so favorable the success of the operation will depend upon whether the operation can be done quickly, the heart spared as much as possible, loss of blood be prevented and the local condition be not so far advanced that a resection of some neighboring organ may be necessary.

Our experience has taught us to consider every operation for carcinoma of the uterine cervix as an exploratory section. With this in view as recommended by Doderlein\* we first palpate the regional lymph glands. If enlarged lymph-gland tumors are present an attempt is made to remove them; if this proves impossible the operation is abandoned and the abdomen is closed; the operation remains an exploratory laparotomy. Next to the lymph glands comes the investigation of the ureters; if the ureters are dilated, revealing themselves through the peritoneum, then it is necessary to prepare them, because the dilatation simply proves that the carcinoma is compressing them, and only by preparing them, particularly their vesical position, can one determine if it is possible to liberate them or not. After this one investigates the bladder and rectum. Bladder fixation usually reveals itself by the formation of a collar and a crumpled-up condition of the peritoneum over the affected area, as described by Hannes.† This, of course, does not prove that a resection

\* Hegars, Bectr. ix, p. 183. Kromer, *Arch. f. Gyn.*, lxxiii, p. 139.

† Habilitationsschrift, 1907, Breslau.



of the bladder is necessary. With the usual method of loosening the bladder in a case of this kind one does not make much progress, but the method of loosening the bladder from the "side of the ureters," as described before, is of better service. If the bladder is already attacked by the carcinoma, then its loosening even from the "side of the ureters" is of no avail, resection is the only thing left.

From a statistical point of view only those cases of laparotomy for uterine carcinoma can be considered exploratory, where the extirpation of the uterus was not performed.\* One must adhere closely to this rule, for even in cases where the extirpation of the uterus is undertaken because the operator finds it necessary to proceed or drainage through the vagina is called for, although he is aware of the uselessness of the operation, this cannot be regarded as an exploratory laparotomy. It is true that no radical operation was intended, but where should the border line be drawn? Where the uterus has been extirpated and during the operation it is discovered, for instance, that the enlarged lymph glands are not removable, the case should not be allowed to be taken out of the class of radical operations and classed under exploratory or palliative operation; nor should anyone take a case out of the radical operation class, if it is found, for instance, that the parametrium is so involved as not to permit one to reach sound tissue. Every case where the operation has reached the stage of extirpation of the uterus, should be considered as a case of radical operation and included as such statistically. Franz and Zinsser defend energetically this same position.†

The number of cases operated on vaginally, on account of special contraindications together with the nonoperative cases, amounts to 440. Among these we include seventy-three exploratory laparotomies—a relatively large percentage, about 16.4 per cent. This is owing to the fact that in some cases it is most difficult to arrive at a conclusion as to the indications for or against an operation and also because it was our wish not to deny operative aid even in a single case where help was possible. This procedure served us well, for among our 500 radical operations there were many cases that appeared to us hopeless before operation. From a recent work of Allhorn‡ we learn that out

\* Winter, *zeitschr. f. Gyn.*, 1902, Nos. 4 and 21. Wertheim, *zeitschr. f. Gyn.*, 1902, Nos. 9 and 24.

† *Arch. f. Gyn.*, Bd. xci, p. 611.

‡ *Arch. f. Gyn.*, Bd. xcii, p. 233.



of 221 apparently inoperable cases forty-two became exploratory, that is to say, about 20 per cent.

During the eleven years, in which the 500 extended abdominal operations were done for cervix carcinoma, only twenty-one vaginal extirpations were performed. In five out of these twenty-one cases (2, 3, 5, 19, 21) the abdominal route could not be chosen on account of the extreme adiposity of the abdomen. In three of these (2, 19, 21) the abdomen had already been opened, while in the other two (3, 5) the abdominal route was not even considered, the vaginal route was the only practical way for the operation. One can readily understand that if the true pelvis cannot be cleared, even with extreme elevation of the same, then the extended abdominal operation cannot be carried out. Fortunately these cases are few, but where the abdomen is very fat it puts an absolute barrier on the operation.

In eleven other cases (4, 6, 7, 8, 10, 11, 13, 14, 16, 18, 20) these technical difficulties to the extended abdominal operation were not present, but the heart and general condition of the patient, as a result of myocardial degeneration and cachexia or old age, were such as to make us believe that they could not withstand the extended operation. Heart failure has played no small rôle in our mortality table and we have learned to fear the same. With the shortening of the period of narcosis, with the substitution of lumbar anesthesia, and with the development of our operative technic our results have greatly improved, and, in consequence, our recourse to vaginal extirpation has become less frequent.

Five cases remain (1, 9, 12, 15, 17) where no abdominal operation was done because the character of the disease was not substantiated microscopically. We openly admit that cases of this kind were not submitted to the extended abdominal operation because of the ever-present high mortality. It is to be observed that in consequence of the extended abdominal operation we became aware of the fact that even in cases with minute primary foci, the parametrium and lymph glands may be carcinomatous. For this reason, since our operative mortality has been reduced, we have not resorted to vaginal operation.

Franz\* is also of the opinion that old age (above sixty-five) and extreme adiposity are contraindications to abdominal operation.

\* Franz and Zinsser, *Arch. f. Gyn.*, Bd. xci, Heft 3.

## C. OPERATIVE MORTALITY.

The mortality from the operation, at first very high, has gradually diminished.

In the first 100 cases there were	30 deaths
In the second 100 cases there were	22 deaths
In the third 100 cases there were	17 deaths
In the fourth 100 cases there were	9 deaths
In the fifth 100 cases there were	15 deaths

Total,	93
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All cases of death are here included whether directly due to the operation or not.

If we arrange the cases of death as to cause (all postmortem sections were done either by Prof. Schlagerhauser or his assistants) we have the following order (Table 4):

1. Mechanical ileus..... 3 cases (16, 225, 412)
2. Mesenteric arterial closure of the duodenum..... 1 case (44)
3. Postoperative bleeding..... 2 cases (201, 147)
4. Embolism of pulmonary artery..... 4 cases (62, 140, 239, 435)
5. Embolism of cerebrum..... 1 case (129)
6. Choking..... 1 case (301)
7. Lumbar anesthesia..... 1 case (361)
8. Acute miliary tuberculosis..... 1 case (54)
9. Purulent bronchitis and lobar pneumonia..... 2 cases (121, 133)
10. Diphtheria of rectum and colon..... 3 cases (213, 237, 349)
11. Uremia following ligation of ureters. 1 case (5)
12. Pyelonephritis..... 9 cases (17, 25, 36, 188, 208, 401, 419, 449, 493)
13. Peritonitis..... 39 cases (12, 18, 23, 29, 49, 57, 58, 69, 75, 80, 93, 94, 98, 100, 127, 128, 136, 138, 143, 145, 150, 151, 197, 201, 216, 223, 232, 259, 275, 282, 289, 307, 313, 336, 348, 405, 407, 436, 438)
14. Feeble heart and cachexia..... 22 cases (1, 3, 8, 11, 23, 28, 38, 157, 166, 173, 184, 192, 196, 202, 214, 224, 293, 393, 399, 442, 460, 494)
15. Pyemia (twice thrombophlebitis of vena hypogastrica, once endocarditis septica)..... 3 cases (179, 430, 488)
- Total..... 93

Hardly anything further need be said about the first ten numbers on this table.

In case 7 the general condition of the patient was so poor that spinal anesthesia was preferred; Stovain (Billon) 0.10 was injected. The operation had hardly been begun (and while the pelvis was being elevated) when respiration ceased and the pulse became imperceptible. The pulse returned with efforts at artificial respiration but the breathing did not. The evacuation of 3 cm. of cerebrospinal fluid had no effect, but respiration returned after forty-five minutes of constant endeavor, following faradization

of the phrenic nerve. The night after the operation the patient had four or five convulsions limited to the right side of the body, followed by coma with maximum myosis and no pupillary reaction. With continued coma death came on three days after operation. From the history of the patient it was learned that since her climacteric she suffered repeatedly with convulsions limited to the right side of the body, always followed by coma, and that the patient was under treatment for a long time at the clinic of Kraft-Ebing. Four months before the operation she suffered her last attack.

In the case of choking (301), stomach lavage was practised when copious vomiting set in, immediately extreme cyanosis occurred and all attempts at resuscitation failed.

While in the first ten cases on this list the causes of death were such as might occur in ordinary laparotomies, the following causes of death have a direct bearing on the technic of the operation and therefore call for a fuller discussion.

In thirty-nine cases the cause of death was peritonitis. In some cases there was actual pus formation, in other cases (as in 29, 49, 94, 98, 136, 150, 197, 259, 313), only bowel paresis was present without visible signs of peritoneal inflammation.

In nineteen of the thirty-nine cases of peritonitis we were able to determine the source of the infection as shown in the following table:

Infection from the primary focus of carcinoma.	{	Infection occurred at the time that the loosened organs were extracted through the vulva, before we began with the practice of vaginal clamping—three cases—12, 18, 23.
		Vagina incised before clamps were applied and primary focus of carcinoma was not prepared—one case—75.
		From a break in the nonprepared carcinoma focus (case 57).
		From a break in the carcinoma focus which was prepared—one case—223.
		From reopening the abdomen for a lost pad—one case—58.
		Infection from the laparotomy wound—four cases—100, 127, 128, 216.
		Infection from the subperitoneal space—five cases—138, 201, 275, 282, 407.
		Rupture of a pyometra—one case—289.
		Rupture of a pyosalpinx—one case—436.
		Tearing away of an implanted ureter—one case—93.
Total.....19 cases.		

In twenty cases of peritonitis the source of the infection could not be clearly determined. It is impossible to say to what extent infection may have come from germ life present in the lymph apparatus or parametrium or, in spite of all precautions, perhaps from the vagina or from unknown sources.

Peritonitis was largely the cause of death in abdominal operations for uterine carcinoma even before the era of the extended abdominal operation. By the previously mentioned method (the preparation of the primary focus, the clamping off of the vagina before it is opened), we were able to diminish the danger of infection from the primary focus. This is proven by the fact that peritonitis occurred fourteen times in the first hundred operations; eight in the second hundred; four in the third hundred; five in the fourth hundred, and only three in the fifth hundred. It is to be hoped that we will be able to diminish further the occurrence of peritonitis in the extended operation, although this is questionable, if we agree with Veit, Bumm and others, that pyogenic microorganisms are found in the parametrium and glands where dissemination of the carcinoma has occurred.

In twenty-two cases autopsy showed myocardial degeneration, atrophy of the heart muscle, general arteriosclerosis. These were the cases of heart death, nor could anything else be discovered clinically, the heart action becoming feebler and feebler until the end. A decided improvement has taken place in this regard; first, because in all heart cases we have endeavored to shorten the period of narcosis and secondly to use lumbar anesthesia where the heart action is decidedly weakened.

It is to be observed that in the twenty-two cases of heart death, seven were in women above the age of sixty and while there were only twenty-six cases over sixty years of age in all of our 500 cases, more than a quarter of these died of heart insufficiency after the operation. If we bear in mind the mortality rate in our operation on old women, we find that it amounts to 50 per cent. as compared with 16.4 per cent. (if we subtract the cases over sixty years old). Figures like these speak for themselves, which we show with respect to Zweifel\* who seems inclined to oppose the diagnosis of "heart weakness." In the twenty-two cases of heart death, that were otherwise found free from disease, we cannot admit that Zweifel's contention holds good, that heart weakness is only a symptom of an acute poisoning from absorption of toxins of intraperitoneal germ life, or that it

\* Zweifel, *Zentralbl. f. Gyn.*, 1909, No. 32.



is an end condition of a severe blood loss, from which the patient never recovered. We certainly did not run short of cases of peritonitis. We had thirty-nine deaths from peritonitis and we include all the cases of intestinal paresis, even though no visible signs of peritoneal inflammation were present. That pure heart failure cases exist, cannot be denied, especially in view of the severity of the operation on patients already debilitated by ill health. A confirmative point in this regard is also the fact that our mortality from heart failure became lessened after we shortened the period of narcosis and availed ourselves of spinal anesthesia in heart cases, and then our mortality never rose as high again as it was at first. There can be no doubt that the danger of the operation rises as the indications for the operation lessen, an opinion shared by Mackenrodt.\* The weakened condition of the general organism and the heart as a result of the advance of the carcinoma and the effect of the repeated losses of blood and absorption of toxic products is an important factor, and must not be overlooked in the determination of the indications for operation. Moreover, Zweifel himself had no considerable number of deaths from cardiac and cachexia cases.†

We must devote a few words to the cases of death with ureter disturbance, twelve of which must be considered. As far as the nine cases of pyelonephritis are concerned (see Table 4) there were three with ureter fistula (17, 36, 188). Although in case 188 death occurred only three years after operation, yet it would be hardly fair not to include this case in the table of primary mortality. Under careful nourishing and with a strong constitution a long period may elapse before the ascending infection leads to a demise. In five cases (25, 401, 419, 449, 493) as near as we can determine, the ascending infection came from the bladder. We have already spoken of the bladder paralysis and weakening of the ureter peristalsis in the extended abdominal operation. In the ninth case the pyelonephritis (208) was undoubtedly the result of an impervious (tuberculous) ureter.

In the other three ureter deaths; in case 5 uremia set in as a result of ureter ligation with a bladder stitch.

Autopsy showed a horseshoe kidney. In case 93 the implanted ureter tore away from the bladder from tension, with the result of a urine-peritonitis. In case 407 ureter necrosis resulted in a subperitoneal phlegmon which led to a peritonitis.

\* *Berliner Gyn. Ges.*, Nov., 1908.

† Alhorn, *Arch. f. Gyn.*,

## D. THE RECURRENCES OF THE CANCER.

Among the operated cases that remained under observation for at least five years, amounting to 250, we found recurrences of the cancer in seventy-eight cases as follows:

In the first year	41 recurrences
In the second year	24 recurrences
In the third year	6 recurrences
In the fourth year	4 recurrences
In the fifth year	3 recurrences
Total	78

Against these seventy-eight recurrences there were 106 cases with no recurrences, 106 plus 78 equals 184; adding to this the sixty-three cases of death from operation and the three cases dying of intercurrent diseases (14, 156, 230) we get the total of 250 cases operated upon.

In the majority of cases the recurrences came from the region of the iliac lymph glands; at least that was our impression. On the autopsy table the location of the beginning of the recurrence could not, as a rule, be definitely determined; here clinical observations tell more. As a rule, the first thing that one can observe are pebble-sized masses spread out along the bony pelvic floor. In some individual cases the masses of recurrences cannot be felt from below (naturally only by rectal examination because the vagina is greatly shortened by the operation). In cases of this kind where rectal examination does not reveal them, at least in the beginning, it is difficult to discover the masses of recurrence. The beginning cachexia and the ever-present local pain, point to a suspicion of the recurrence of the tumor, and if the case is kept under observation the recurrent masses will eventually become palpable on examination.

Only in the minority of our cases did the recurrence appear in the scar tissue. With Franz,\* we designate as scar recurrences only those cases where it takes place in the operative wound. The thoroughness with which we operate accounts for the small number of scar recurrences in our experience. Scar recurrences are more frequently the case after simple vaginal extirpation. In the extended operation it is of importance to what extent the "erweiterte" extends. If the ureters only are laid bare, and the tissues of the parametrium are more or less allowed to remain, scar recurrences will be relatively more frequent.

In diagnosing scar recurrence one must be constantly on the alert against errors, especially in the beginning of their develop-

\* *Arch. f. Gyn.*, 1906, Bd. lxxx, H. 2.

ment. The scar formation in the extended abdominal operation is of itself massive and firm, and repeatedly did my younger assistant diagnose recurrences, where the only thing that was present was an unusually firm scar in the operative field of the small pelvis. It is possible here, as in other operations, to have an exudation and swelling appear around a stump which has become included in the scar and under these conditions the mass may be mistaken for a recurrence. Alhorn\* also called attention to this. As a rule, these cases clear up in time (see cases 22, 35, 40, 114). If one feels absolutely sure of the diagnosis and does not consider the possibility of error, the case may come to an unnecessary operation, which is to be regretted, as under such a condition an operation is always very dangerous. Franz† had this experience in three cases and I had one myself (297). In this case there was a mass the size of a plum, situated at the symphysis in the scar of the operative wound, in a case where the bladder was resected. Franz, in one case (3) found a hard mass on the left side of the pelvic floor the size of a walnut, in the second case (7) a hard mass in the left parametrium, and in the third case (9) a small hard mass also on the floor of the pelvis on the left side.

Operation for real recurrences in all our cases was never permissible. This is in consequence of the nature of the recurrence. Of what use is it to operate on these cases of recurrence, where the reappearing masses have spread themselves on the pelvic floor or invaded the scar tissue. The dangers of attempts of that nature are very great, where the tearing apart of adherent organs may result in their rupture. The uselessness of operation for recurrence depends on the radicalism with which the primary operation was done, and one can assert that the more radical the primary operation the less useful the eventual operation for recurrence.

It is worthy of notice, that in contrast to us Rosthorn‡ and Franz\*\* had a series of cases where, after the extended abdominal operation, the patients were reoperated for recurrence and in a few cases this was done repeatedly.

Franz is inclined to believe that some of his cases of recurrence were implantation recurrence (*Impfrezidiven*) which may be true of the two cases where the recurrent nodules were located in

\* *Arch. f. Gyn.*, Bd. xcii, p. 237.

† Stickle, *Arch. f. Gyn.*, Bd. xc, H. 2.

‡ Kong. zu Kiel., 1905.

\*\* *Arch. f. Gyn.*, 1906, Bd. lxxx, H. 2.

the laparotomy wound.\* Without wishing to deny the possibility of an implantation recurrence, we wish to assert that by means of the extended abdominal operation it is very easy to avoid them. We can avoid the implantation of cancer cells if the loosening of the diseased lymph glands and parametrium is done with care and circumspection, not allowing these glands to tear, break and crumble. Also the method of vaginal clamping, and the extraction of the loosened organs from below, will aid in avoiding implantation. The only thing that will favor this is the unavoidable tearing of the cancer mass during the operation. Looking over our material from this standpoint, we first find that we had twenty-four cases where the cancer broke (81, 82, 101, 107, 114, 115, 134, 135, 156, 162, 169, 187, 228, 265, 290, 304, 315, 339, 341, 350, 380, 394, 408, 434); also in eleven cases in the beginning of our experience, before we practised vaginal clamping or extraction of the loosened organs from below (2, 4, 6, 7, 9, 10, 13, 15, 19, 21, 22). Out of these thirty-five cases nineteen had recurrences and as the latter cases are of recent date, it is not at all unlikely that the number of cases of recurrence will be much higher. This is a relatively high percentage (more than 54 per cent. as compared with the ordinary 42.4 per cent.). It would, however, be an error to draw from this the conclusion that recurrence in the scar is favored in those cases where the carcinoma breaks during the operation because these cases have already far advanced cancerous masses and recurrences are to be expected in larger numbers (in nine of these cases the regional lymph glands were diseased).

Admitting that the cases of Franz were truly instances of implantation recurrences, which, however, was not proven,† then the circumstance that we had no such an instance in all of our 500 cases, forces the supposition that perhaps their technique in the extended abdominal operation (perhaps the failure to use the vaginal clamps or the failure to prepare properly the primary focus of the carcinoma) is to be blamed.

At least as such appears to us the case Zurhelle reported.‡ The vaginal clamps were used, as is expressly stated. But from the description of the operation it appears that a large crumbling cauliflower growth which was present, was not prepared before operation by cureting and cauterization. Even with good clamps that close accurately and do not allow

\* Stickel, l. c. cases 4 and 5.

† Raabe, *Hegar's Beitr.*, xvii, 2.

‡ *Arch. f. Gyn.*, Bd. lxxxi, H. 2.



cancer particles to pass when they are applied on the vagina, it is possible that particles of the growth became detached during the manipulation and handling of the uterus, which soiled the vaginal wall, and when the latter was cut through beneath the clamps the cancer particles were present and hence the resulting implantation recurrence.\*

With our method of operating, cancer implantation can hardly occur; not only that we begin the operation with a thorough excochleation and Paquelinization of the primary focus and resort to clamping of the vagina, but before the clamps are applied we mop out the vagina again so as to remove particles of tissue and squeezed out tissue juices and as soon as a small opening is made through the vaginal wall a piece of sterile gauze is at once shoved through into the vagina to wipe everything away and prevent every possible contamination of the operative wound.

As far as the relation of recurrences to the primary focus is concerned, there can be no doubt that the greater the advance of the growth at the time of the operation the greater the probability of recurrence. This is so self-evident, that a further corroboration by material at hand is superfluous. Where resection of the ureters or bladder had to be resorted to or where post-operative necrosis of these organs set in, the results were, as in Zweifel's clinic,† very unfavorable. Nevertheless it is a noteworthy fact, that a whole series of greatly advanced cases remained free of recurrences and we cannot agree with Jacobs when he asserts‡ that a so-called radical operation is of no value when the cancer has spread into the tissues of the parametrium, bladder or rectum. In our 106 cases free from recurrences (the second half of our 500 cases are of too recent a date to be considered) there were ten cases (48, 66, 78, 81, 124, 141, 161, 185, 233, 244) that were declared inoperable by prominent operators. In nine other cases remaining free of recurrence (15, 22, 32, 56, 137, 183, 185, 204, 247) the cancer advanced toward the ureter to an extent that it had to be dug out of the carcinoma tissue completely surrounding it. In three other cases free from recurrence (187, 233, 235) the wall of the rectum was affected; in other cases (for instance 67, 92, 149, 183, 187,

\* In the case of Kossman (*München. med. Woch.*, 1904, Nr. 31, p. 1409) the description is so meager that no value can be placed on its report and the same can be said about the two cases of abdominal scar recurrence from the Jenner Clinic (Stricle, *Arch. f. Gyn.*, Bd. 90, H. 2, cases 4 and 5).

† Alhorn, *Arch. f. Gyn.*, Bd. xcii, p. 244.

‡ Internat. Chirurg. Kongress. Brussels, 1908.

233), the bladder was so far involved that its loosening was effected with great difficulty, and parts of its muscular wall had to be left behind attached to the growth, and in a whole row of other cases free from recurrence (for instance 46, 110, 112, 118, 122, 153, 198), the parametrium was so infiltrated that in clearing off the same from the pelvic floor it gave the impression that we were boring through cancer tissue.

The often repeated assertion that there is less tendency for recurrences in the cases of cancer of the body of the uterus than in those of the cervix, has not been borne out by our material. Aside from the fact that, in the majority of cases, the starting-point of the tumor cannot be definitely determined, there is no doubt, that in certain cases of body-carcinoma the malignancy is such that a rapid recurrence takes place even after a very thorough removal. It is impossible for us to give statistics on this point, because the starting-point of the cancerous new formation in the cases of *collum uteri* cannot be determined.

It is also of importance to consider further the age of the patient, the consistency of the new growth, as well as its histological structure. It has become a firm conviction that it is seldom possible to save younger people from the ravages of cancer. We have arranged our material in reference to this point and have found that this is by no means the case. In our 106 cases free from recurrences there are twelve cases under thirty years of age (11.3 per cent.) and we only expected 7.6 per cent. (among 184 cases—250—sixty-three primary deaths—three deaths from intercurrent disease—184—there were fourteen cases under thirty years of age). On the contrary our statistics show that the younger cases present a more favorable aspect.

As far as the histological structure of these new formations is concerned, Pfannensteil has repeatedly shown that the flat epithelial carcinoma are more favorable than the cylindrical epithelial carcinoma, and further that the size, shape and structure of the individual cells are to be observed and the arrangement of the tissue and the manner with which it infiltrates is of great importance.

If one admits that the anaplastic indifferent cell formation, "which protean-like appears in the most wonderful pictures" (Kromer) speaks for unusual malignancy of the tumor, then it does not agree with the idea of Pfannensteil, who drew conclusions from a large amount of material. We only have to mention here the fact that in almost all of our cases histological and

microscopical examination showed flat epithelial carcinoma (in only about 5 per cent. of cases was cylindrical cell carcinoma present). We have often found that with the polymorphocellular or anaplastic tumors the regional lymph glands remained free from carcinoma invasion, while this is not seldom the case with the so-called (gutartigen) less malignant varieties, with epithelial formation reminding one of an epidermis structure.

The ever repeated assertion that pregnancy has an unfavorable effect on the prognosis of recurrences, was not in accordance with our experience. In our first 250 cases, pregnancy occurred in six cases (30, 91, 139, 175, 211, 239) (see also *Zentral f. Gyn.*, 1906, p. 158). In one case (239) death followed 14 days after operation, from embolism of the pulmonary artery, in the other five cases (30, 91, 139, 175, 211) no recurrence was found after five years. To this we may add one case (41) of extrauterine pregnancy with no recurrence. It is worthy of note that in all of these seven cases, complicated by pregnancy, in only one (239) were the lymph glands cancerous. The Zweifel clinic\* reports ten cases complicated by pregnancy and comes to the conclusion that the assertion that during pregnancy and puerperium there is a radical advance of the cancer and a resulting early recurrence is not confirmed.

The prognosis is very unfavorable in reference to recurrence in cases where the lymph glands become cancerous, not only in those cases where the malignant process has greatly advanced, but also in those cases where the primary focus is still in the early process of development. In our first 250 cases, in sixty-two cases carcinoma was found in the regional lymph glands (35, 10, 11, 14, 16, 19, 21, 28, 33, 37, 44, 45, 48, 57, 61, 62, 63, 68, 71, 75, 81, 82, 83, 85, 92, 93, 95, 100, 101, 102, 103, 106, 109, 117, 129, 133, 134, 138, 143, 144, 145, 154, 155, 168, 169, 173, 176, 178, 186, 196, 197, 198, 200, 206, 273, 236, 228, 239, 246, 249) that is to say nearly 25 per cent. Among these sixty-two cases twenty died from the operation, one (14) died of intercurrent disease, leaving forty-one cases of lymph-gland carcinoma, from which to judge of the value of extirpation. Only five cases out of these forty-one have remained free of recurrence after five years (81, 92, 198, 233, 249).

In 142 cases that were free of carcinomatous lymph glands at the time of operation, 100 cases remained free from recurrence; that is to say, 87.8 per cent. of cases with carcinomatous lymph

\* Alhorn, *Arch. f. Gyn.*, Bd. cii.



glands had recurrences as against 29.5 per cent. of recurrences in those that had no cancer infiltration of lymph glands at the time of operation.

Closer scrutiny of the five cases that remained free of recurrence reveals the fact, that in all of these, only one gland or only a few individual lymph glands were diseased at the time of operation. Where multiple lymph glands were diseased, or where the operation revealed a more or less extensive distribution of the diseased glands, our experience does not permit us to expect them to remain free of recurrence even after careful removal.

It is to be observed that histologically, of the five cases of extirpated lymph-gland carcinoma remaining free of recurrence, one (81) was of the cylinder epithelium type, while the other four were flat epithelial carcinoma.

In the second 250 cases there were also sixty-two cases of cancer involvement of the lymph glands (251, 255, 261, 262, 266, 271, 288, 298, 303, 314, 317, 319, 326, 328, 330, 344, 348, 351, 355, 358, 362, 372, 380, 381, 389, 391, 392, 393, 396, 398, 404, 413, 414, 421, 424, 425, 427, 429, 432, 435, 445, 447, 451, 455, 458, 459, 465, 468, 470, 474, 475, 477, 478, 487, 488, 490, 492, 493, 494, 495, 496). In the 500 cases we had 25 per cent. of lymph-gland carcinoma. This number is in accordance with the experience of other operators. (Hochstein 27 per cent.; Döderlein 22.8 per cent.; Zweifel 24 per cent., etc. Brunet, on the other hand, gives 51 per cent.; Rosthorn 57.7 per cent.).

This case (81) was very interesting as it appears that it was one of malignant adenoma of the duct of Gärtner, similar to the two cases of R. Meyer.\* This case will be published after a more careful study.

Here is the proper place to speak of those peculiar skin-like formations, not infrequently encountered in the regional lymph gland in uterine cancer and which point to some unfamiliar tissue inclusions. Ries† was the first to discover and describe these structures. He pointed out that these structures were detached portions of the Wolffian bodies, inasmuch as in his cases characteristic Recklinghausen cornual adenomyoma were present. Wulfig\* who discovered similar structures in the regional lymph glands in a case of cervix carcinoma also

\* *Virchow's, Arch.*, 1903, Bd. clxxiv, p. 270; and *Zeitschr. f. Geb. u. Gyn.*, Bd. lxx, p. 242.

† *Zeitschr. f. Geb. u. Gyn.*, 1897, Bd. xxxvii, p. 523.



agrees with the same opinion. The circumstance that the cylinder epithelium carrying space was surrounded by loose connective tissue, and in places imbedded in richly cytogenic cellular tissue, in his opinion precluded the possibility of its being a metastatic structure. In Wulfing's case also an adenomyoma of the cornua was present. I saw this myself for the first time in the year 1898 in an operated case (2) and reported it in the *Arch. f. Geb. u. Gyn.*, Bd. lxi, H. 3 (Table 15, Fig. 3a). Other investigators have busied themselves with the same including Kermauner, Lameris, Kromer, Berst, Kleinhaus and others.

In the course of our histological studies we were able to determine that these unfamiliar structures in the regional lymph glands occurred with relative frequency (11 per cent. in all of the cases) which led us to undertake control experiments of iliac lymph glands in eighty corpses with no uterine cancers.† As in none of these cases could be discovered any of these structures, we were forced to the conclusion, contrary to Reis and Wulfing, that these structures have nothing to do with the Wolffian bodies. However, our control investigation did not extend far enough, because shortly after R. Meyer‡ reported that he discovered the same structures in lymph glands enlarged from inflammation, where carcinoma was positively excluded. We again took up the investigation\*\* and were able to confirm this. The supposition thus became more definite that perhaps, after all, the matter concerns itself with cancer metastases in the lymph glands.

If any doubt remained in reference to this question, it was set aside by the examinations of our operated cases. In our first 250 cases, these tissue inclusions occurred in twenty-eight (2, 39, 40, 60, 62, 78, 88, 90, 100, 110, 113, 119, 131, 132, 142, 147, 150, 153, 159, 160, 163, 198, 204, 215, 224, 244, 247, 248) or 11.2 per cent. In three of these cases (62, 100, 198) with the characteristic tissue inclusion, there were also typical carcinoma metastases found. Six cases (62, 100, 142, 147, 150, 224) died from the operation. Twenty-one cases remained from which to draw conclusion as to the later results in cases where the regional lymph glands contained these structures.

\* *Zeitschr. f. Geb. u. Gyn.*, 1901, Bd. xliv.

† *Zentralbl. f. Gyn.*, 1903, No. 4.

‡ *Zeitschr. f. Geb. u. Gyn.*, 1903, Bd. xlix, p. 555.

\*\* Falkner, *Zentr. f. Gyn.*, 1903, p. 1496.

As observed before, out of the forty-one cases where definite lymph-gland carcinoma was found, only five cases remained free of recurrence after five years, while in the above twenty-one cases eighteen remained free of recurrence after five years.

In the second 250 cases, these inclusions were found in twenty cases (256, 261, 268, 276, 288, 330, 340, 355, 381, 384, 389, 407, 417, 432, 437, 444, 448, 453, 470, 488). In nine cases typical carcinoma was also present (261, 288, 330, 355, 381, 389, 432, 470, 488).

In more recent years H. Albrecht and L. Arzt\* have busied themselves with this question of tissue inclusion. Albrecht agrees with the hypothesis of Reis contrary to R. Meyer, who claims these structures are the result of inflammatory irritation of the endothelium of the lymph glands.

In fact the microscopic pictures of these cases of inclusion will hardly permit one to believe that they can be the result of irritation by inflammation of the endothelium of the lymph glands. The high cylinder epithelium shows a plainly recognizable glistening substance and the arrangement of the skin-like structure is somewhat similar to the tissue described by Recklinghausen as adenomyoma of the uterus. Does not the button-like picture in Fig. 8 remind one very much of a pseudo-glomerulus of the kidney.

We have attempted further to differentiate cases in which the lymph glands were free of cancer and hope to gain thereby recognition for a class of cases presenting an infection in the lymph glands, but with no manifestation of cancer cells at the time of the microscopic examination. It is possible that the lymph gland may be infected with cancer at the time of the examination, but the microscope does not show characteristic cell changes, because sufficient time has not elapsed for the development of characteristic cells. The proof of the existence of such a latent stage would be of the utmost importance, not only in so far as the technic of the operation is concerned, but also from a scientific standpoint.

With this in view, we have divided our cases, into those with little or only slight enlargement of the cancer-free lymph glands and those where the lymph glands were free of cancer but greatly swollen. But no decided differences were found. Among twenty-three cases with swollen lymph glands 26 per cent. had

\* Beitr. zur Frage der Gewebe., *Frankfurter, Zeitschr. f. Pathol.*, 1910, Bd. iv, H. 1.

recurrences, while out of 119 cases with none, or very little swelling of lymph glands 30 per cent. had recurrence.

That the presence of cancerous lymph glands affords so unfavorable a prognosis in reference to recurrences is due to the fact that the thorough extirpation of the lymph apparatus is possible only in a small number of cases. Small hidden lymph glands, overlooked in the operation, are already infected. It is a fact that in all the cases coming under consideration, the recurrences have been found in the region of the iliac lymph glands, except case 10, where the recurrence was in the scar of the vagina, and as a rule the recurrence appeared on the side where the carcinomatous lymph glands existed (excepting cases 21, 45, 206, 226, where the recurrence was on the other side). Only in a very few cases (for instance 186) was the recurrent tumor located so high up as to force us to believe that the glands located higher up were affected, and only for these very infrequent cases does Schauta's contention hold good, that the extirpation of cancer-infected lymph glands is of no use, because when the iliac lymph glands are affected the glands situated higher up are also infected.

#### E. LATE RESULTS AND ABSOLUTE ACCOMPLISHMENTS.

Thanks to the endeavors of Winters, a unification has been brought about, with references to all points, in the statistical calculation of what can be accomplished with the operation for uterine carcinoma, up to the so-called "*disappeared*" cases; that is to say, cases that disappear within the five-year limit of observation. Winters holds that these cases should be deducted and assumes the position that statistics with great numbers of "*disappeared*" cases have no value.

In this connection, we wish to point out that this position is really in opposition to the advisability of deduction of the disappeared cases, and we persist that the disappeared cases must not be allowed to be deducted.\* One cannot insist too strenuously upon the value of numbers for the purpose of statistics; even if we are hard hit, we do not wish to be deceived. The deduction of disappeared cases in favor of statistics may lead to faultier conclusion than if we allow these cases to, act perhaps, unfavorably on the statistics. If a grateful patient, who has been liberated by operation from the clutches of so serious a

\* Wertheim, *Intern. Med. Kongr.*, Budapest, 1909.

disease as cancer does not respond to the inquiries of the operator, it is presumed that she is ill again, or perhaps has died.

There is a remedy by means of which one can guard against having to deal with lost or disappeared cases. All one has to do, in taking the history of the patient is, to make note, not only of the address of the patient, but of relatives, including their profession, their working place, and also the name and address of the physician who referred them for operation. If the patient herself does not respond to the call of the operator then the relatives or doctor are written to. In this way some information is obtained, or the inquiry will lead to some clue for further information. In this way we succeeded in not losing a single case out of our evidence. This, of course, means much work, but leads to valuable results by improving the quality of the statistics, as by this means we are able to control those operated cases, that for one reason or another fail to come forward. At any rate statistics created in this manner will have "disappeared" cases in sparing numbers and these few are to be counted as cases of recurrence, which is more pleasant for the operator, as he is not reproached for failing to inquire diligently into the destiny of all his cases.

There has been a unification in all other points. According to the Winters,\* the five years' period for observation must include all cases of deaths from operation, without deductions, all cases that came to extirpation of uterus although cancer tissue is left behind, and all later deaths where autopsy does not clearly prove that death was due to causes other than the removal of the cancerous uterus. All calculations, as to the "late results" and "absolute accomplishments," must be made on the above basis, no matter in what manner one proceeds.

Somewhat complicated appeared to us the question just how to deal with the cases of vaginal operations for collum carcinoma. Fehling and Henkel have already pointed out the difficulties of calculations in cases where operations are done by the combined vaginal and abdominal methods.† Winter contends that the results of each operation must be calculated. This is not so simple as it appears, as it is impossible to determine for what method of operation the case was most fitted; this objection was also voiced by Schauta and Alhorn. Winters seems to think that in a certain number of cases one could include the results of both

\* *Zentr. f. Gyn.*, 1908, Nos. 6 and 36.

† *Zentr. f. Gyn.*, 1908, No. 36, p. 1180.



operations to show what could be accomplished with carcinoma cases. After mature consideration I came to the conclusion to include the vaginal operations under the nonoperative cases, because there were relatively few cases (9, 250) and because of the fact that the operation whose value is under scrutiny was not performed. Nor can we be reproached that we are partial toward our own statistics. By adding these cases to the inoperable ones, the percentage of operable cases is apparently made more unfavorable, but in reality the opposite is the case.

Among 500 cases of extended abdominal operations reported above, 250 cases have remained over the five years' period, and therefore come under the consideration of our statistics.

If we leave out of account the primary mortality in considering our "late results," we have the following:

250-63 operation deaths - 3 deaths from intercurrent disease (14, 156, 230) = 184.

Among these there were no recurrence after five years in 106,

$$184 : 106 = 100 : D'$$

$$D = 57.6 \text{ per cent.}$$

If we consider the operative mortality according to Zange-meister we have the following:

250-3 cases dying of intercurrent disease = 247

$$247 : 106 = 100 : D$$

$$D = 42.9 \text{ per cent.}$$

Both numbers are of value and instructive;  $D'$  shows the actual "late results" and  $D$  shows the ideal of a radical operation, excluding the primary mortality. In a proper statistical report both should be given, or at least it should be made possible for everyone to calculate this for himself.

In reference to the "actual accomplishments" we must first observe that the first 250 cases included in our calculations, have been taken from 607 patients (ambulatory cases) that presented themselves for cancer of the uterus.

From these 607 cases, besides the three cases dying of intercurrent disease, twenty-eight cases, refusing operation, must also be deducted.

$$607 - 3 - 28 = 576$$

Of these 576 cases 106 remained free of recurrence after the five years' period, that is to say the "actual accomplishment" was = 18.4 per cent.

This method of calculation of the "actual accomplishment"\*

\* Werner, *Zentr. f. Gyn.*, 1905.

is after all the simplest and best. All mistakes occur in computing percentages from multiplications and divisions of decimal points.

Nevertheless, it is not superfluous to use other formulas in computing "actual accomplishments." Winters' formula is as follows:

$$A = \frac{O \times D}{100}$$

"O" indicates the percentage of operated cases, calculated from the number that presented themselves (operabilitäts Prozent); "D" shows the "late results" (excluding the operative mortality). The use of this formula should not be neglected. This formula gives us, similar to the Waldstein formula, those ideal values that can be obtained with an operative for carcinoma, when we succeed in reducing the operative mortality to naught.

In our material "O" shows when we deduct the number of cases that did not submit to operation, from the sum of cases that presented themselves.

$$607 - 28 = 579$$

The proportion is obtained

$$579 : 250 = 100 : O$$

$$O = 43.2 \text{ per cent.}$$

Formula A shows

$$A = \frac{O \times D}{100} \text{ the actual accomplishment } \frac{43.2 \times 57.6}{100} = 24.9$$

per cent.

This original formula of Winters was later displaced by a formula of Waldstein which took into consideration the operative mortality.

This formula reads,  $A = \frac{O \times D \times (100 - M)}{10,000}$ , where "M" indicates the percentage of operative mortality.

According to this formula our cases show as follows:

$$A = \frac{43.2 \times 57.6 \times (100 - 25.2)}{10,000} = 18.6 \text{ per cent.}$$

Winters who acknowledges the right to take off the operative mortality, later\* proposed the following modes for the calculation of the percentage of the absolute accomplishment.

From the total number presenting themselves there are deducted:

\* *Zentr. f. Gyn.*, 1908, No. 6.

1. Number refusing operation (28 cases)
2. The disappeared cases (0)
3. The intercurrent deaths (3 cases)

$$\text{Also } 607 - 28 - 3 = 576$$

From the number so obtained we subtract:

1. Number died from operation (63 cases)
2. Number of recurrences (78 cases)
3. Number of operations remaining (329 cases)

$$\text{Also } 576 - 63 - 78 - 329 = 106$$

From these figures we have

$$576 : 106 = 100 : A$$

or the absolute accomplishment = 18.4 per cent. Schauta used this method of calculation\* in his statistics of the extended total extirpation of the uterus for carcinoma.

It is in the nature of things that statistics of great numbers of cases of extended abdominal operation were up to now never computed to answer the demands of Winters's calculation. Only from the clinic of Zweifel, who was the first to use the extended abdominal operation, is such a report at hand.† This report included 115 operations out of 255 cases that presented themselves. Eleven cases died primarily (mortality 9.5 per cent.); one case died intercurrent (suicide); one case disappeared. As fifty-two cases remained free of recurrences Alhorn calculates  $D = 51$  per cent. (It is necessary to mention that Alhorn deducted not only the intercurrent deaths, but also the disappeared cases) and  $D' = 46$  per cent. The number coinciding with our figures. The "absolute accomplishment" Alhorn calculates

after formula  $A = \frac{O \times D}{100} = 25$  per cent., after the formula

$$A = \frac{O \times D \times (100 - M)}{10,000} = 23.5 \text{ per cent.}$$

Alhorn includes here the twenty-three cases of vaginal operations. If these cases are included under the inoperable ones as in our cases, the result

$$\text{(after Waldstein) would be } A = \frac{45 \times 51 \times 91.5}{10} = 20.99 \text{ per cent.}$$

the Werner method of calculation shows that among 254 cases (after deducting one intercurrent death) with fifty-two cases free from recurrences after the five-year period in abdominal operations, the following:  $A = 20.46$  per cent.

\* Internal Kongress, Budapest, 1909.

† Alhorn, *Arch. f. Gyn.*, Bd. xcii.

But even so it gives, as suggested by Zweifel, an extraordinarily favorable "absolute accomplishment," and on account of the small operative mortality surpasses ours by 2 per cent.

In the reports\* of others as to what can be accomplished with the extended abdominal operation, the number of the five-year periods were too small for reporting. The cases of Schindler from the Gräzer clinic, because of their exceptional position are worthy of note. In the extended abdominal operation, the operator is allowed a great deal of latitude in its accomplishment. In laying bare the ureters a great deal of the parametrium cellular tissue can be removed with the uterus, but even when the ureters are laid bare one can keep well against the uterus and leave behind almost the entire parametrium. While the laying bare of the ureters is a necessary part of the extended abdominal operation, it is not all that follows. Only in this way are the unfavorable results to be explained which are reported by Schindler from the clinic of Rosthorn.† He reported an absolute accomplishment of 2.2 per cent., which makes one think that he deducted the disappeared cases (for in his statistics he only had twenty-seven cases of the five-year period). The circumstance that with so unfavorable later effects, he had excellent primary results, can only be explained on the ground that his radical operations did not extend far enough. We are reminded of the surprise Rosthorn's report created in the "Kongress" at Giessen, where he said that in thirty-one cases of extended abdominal operation he lost only two cases. In fact Rosthorn reported later‡ that his mortality rose with the measure with which he made his operations more radical. In the extended abdominal operation everything depends upon the manner with which it is carried through, and as with other carcinoma operations, the primary results stand in inverse ratio to the late results. The exposure of the ureters alone is of no use; the clearing out of the parametrium establishes the operation.

F. COMPARISON OF WHAT CAN BE ACCOMPLISHED WITH THE  
EXTENDED ABDOMINAL OPERATION AS COMPARED  
WITH THE VAGINAL OPERATION.

As shown in the beginning, the extended abdominal operation was devised owing to the unsatisfactory late results obtained with the vaginal operations in uterine extirpation. That

\* Scheib, Döderlein, Schindler and Mackenrodt.

† *Monatsch. f. Geb. u. Gyn.*, 1906, Feb., Mar., Apr.

‡ *The Journal of the Amer. Med. Assn.*, Dec. 8, 1906.



the abdominal operation would give better "late results" there was *a priori*, no doubt. The further one goes in the extirpation of the cancerous tumor, and especially the further one extends the operation to regions outside of the field of the extension of the malignant process, the more likely that the given operation will prove a radical one. The difficulty encountered with the introduction of the operation was mostly to perfect one's operative technic to such an extent as to win as low an operative mortality as possible.

The superiority of the abdominal operation, however, is not only in theory, but is evidenced by statistics. Up to the time that we began our enlarged abdominal operation, the vaginal method for uterine extirpation only gave a percentage of from 4 to 5 of "absolute accomplishment" and Olshausen, who strenuously defended the vaginal method, admitted with reluctance, which was also voiced by Döderlein, that a 10 per cent. mark is never reached.

If for the purpose of comparison it is superfluous to go into detail in reference to the simple vaginal uterine extirpation method, it is not so with the extended vaginal uterine extirpation method. This operation had its inception in the year 1893 when Schuchardt\* recommended it under the caption of sacral and parasacral uterus extirpation. Schuchardt showed that by opening up the vaginal tract without piercing the ligamenta spinosacralia and tuberosacralia and without severing the levator ani, so much room is gained by the vagina that the parametrium can be exposed and removed, creating the possibility of extending the indication boundary to cases that were otherwise inoperable. Schuchardt in later years improved his method, and had more confidence in the same.† Zierhelle‡ calculated from statistics obtained from the clinic of Fritsch, an absolute accomplishment of 14 per cent. (after Werner's formula).

Jordan and Staude followed the operation of Schuchardt. The latter was not satisfied with the vaginal incision on one side alone, but advanced the vaginal operation further and opened the vagina on both sides, claiming that by this means the paracervical tissues are most approachable. At the Congress at Giesen in 1911 Staude reported 42 cases and soon after (*Zentr. f. Gyn.*, 1908, Nr. 37) was in a position to refer to 104 cases.

\* *Zentr. f. Gyn.*

† Langenbeck, *Arch. f. Gyn.*, Bd. liii, *Kong. d. Deutsch Ges. Giepgen*, 1901; *Mont. f. Geb. u. Gyn.*, 1901.

‡ *Arch. f. Gyn.*, Bd. lxxxii, H. 1.

Schauta developed into a most enthusiastic follower of the Schuchardt operation; with the impression gained from the Congress of Giessen in 1901, he applied himself to the work with the modification that as nothing can be gained from the extirpation of the regional lymph glands and as the parametrium becomes accessible by the Schuchardt operation, why perform a laparotomy? Schauta has developed the technic of this operation to a remarkable extent and especially—at least in the majority of cases—in reference to the systematic preparation of the ureters through the vaginal opening. In this way occurred a parallelism to the extended abdominal operation. In 1908 Schauta published (Monographie) all of his operative material and in 1909 (International Congress—Budapest), he made a report upon these cases.

A critical review of the results of Schauta shows that the accomplishments in the extended vaginal operations were in no way as great as in the extended abdominal operations. At the time that Schauta published his Monograph only forty-seven cases arrived at the fifth-year period out of all his cases. As he deducts nine operative deaths and four dying of intercurrent disease from the forty-seven cases, there remain only thirty-four and from this number after the five-year period only thirteen remained free of recurrence. This gives  $D=38.2$  per cent. against  $D=57.6$  per cent. in our statistics. This great difference in percentage would be still greater if Schauta would have been as vigorous against the intercurrent deaths as we have been, which is also approved of by Winters.\* In none of the four cases of intercurrent death (11, 20, 22, 43) did Schauta prove his contention by autopsy. When we study the history of these four cases, we find that case 11 died eight months after operation of myocarditis; case 20, nearly five months after operation of chronic nephritis; case 22, five and one-half months after operation from unknown causes (this patient was discharged fifteen days after operation suffering with icterus and sleeplessness); case 43, four and one-half years after operation from carcinoma ventriculi (this information was obtained from the doctor who was last attending her and who claimed that no symptoms were present in reference to the pelvic organs). In all of these four cases no definite evidence is given that death was not in some way connected with the operation (primary exitus) nor evidence that no recurrence has taken place. None of these cases can be included among the so-called intercurrent deaths and therefore

\* *Zentralb. f. Gyn.*, 1908, Nr. 36.

his percentage is lowered to  $D = 34.2$  per cent. As far as case 43 is concerned, we have a similar one in our series. In our case 123 nineteen months after operation a diagnosis of carcinoma pylori scirrhosum was made. This was operated on and although at the time of operation no sign of any recurrence in the pelvis was found and the histological structure of the tumor was not the same as that of the cancer of the uterus, we nevertheless counted this case among the cases of recurrence.

In calculating the "absolute accomplishment," Schauta uses the method of Winter.\* He deducts from the total number of cases presenting themselves (116), the cases that refused operation (No. 9) and also the intercurrent deaths, (four) and adds to the number obtained (103) in relation to the number which one gets after subtracting the number of cases dying in operation (nine) the recurrences (twenty-one) and the operative cases (sixty),  $130:13 = 100:A$ .

$$A = 12.6 \text{ per cent.}$$

From our own (250) cases after this method we get 18.4 per cent. of "absolute accomplishment," almost half as much. If we do not subtract the intercurrent deaths (four cases) as Schauta does, then his percentage of "absolute accomplishments" is lowered to 12.1 per cent.

In reference to the 113 cases reported by Schauta in Budapest that were past the five years' limit period, inasmuch as Schauta takes out of calculation five cases of intercurrent deaths and 3 cases "disappeared" he calculates  $D = 39.5$  per cent. and  $D'$  comes to 34.3 per cent.; if, however, we do not deduct the five cases of intercurrent deaths where, after all, no autopsy was made and the three disappeared cases then we get  $D = 36.3$  per cent. and  $D'$  only 31.8 per cent.; this proves that dealing with a small total number of cases even a small number of intercurrent deaths and "disappeared" cases has a tremendous effect on the percentage when we come to calculate the number of the late results, therefore, it is necessary to be very careful in calculating percentages. Stauder† showed that with his method of bilateral incision he obtained 41.5 per cent. of "late results," but it is to be observed that in fifty-eight cases he had six cases of "disappeared" which he leaves out of calculation. Had he proceeded as we think is necessary to do with his "disappeared" cases he would have had only 37 per cent. of "late results": about the same as Schauta

\* *Zentralb. f. Gyn.* 1908, No. 6.

† *Zentralb. f. Gyn.*, 1900, No. 37.



had. Staude had an extraordinary good result (23 per cent.) with his "absolute accomplishment," but here also it is to be observed that he left out of calculation the number of his disappeared cases. Whether the large number of operable cases (72.3 per cent.) that Staude has had reference to advanced to unfavorable cases or to a series of cases relatively favorable, we could not determine from his publication, because his description of the individual cases is very meager. Perhaps the latter is the case, because Staude leaves out of consideration the preparation of the ureters, which, after all, in advanced cases are so firmly fixed in the cancer bed, that they cannot be left out of consideration. The results of the following years in reference to this will determine the above disputed points, but one thing is certain, that the relatively low percentage of "late results" in spite of the high number of operable cases, points to the fact that the vaginal operation has been advanced to its greatest usefulness. Entirely different is the extended abdominal operation for which we can say with certainty that its usefulness has risen as the operative mortality has been lowered, that the operable cases have increased (more than 60 per cent.) and by this means an operative technic is obtained with which one can be most radical.

#### G. REASONS FOR THE SUPERIORITY OF THE EXTENDED ABDOMINAL OPERATION.

The superiority of the extended abdominal operation in reference to the extirpation of the regional lymph glands, is to be considered only to a small extent. If the five cases where extirpation of the cancerous lymph glands was done, had not remained free of recurrence for five years then we should have had  $D = 54.8$  per cent. instead of 59.6 per cent. And "A" (in accordance with Winter II or Werner) would fall from 18.4 per cent. to 17.5 per cent. Even this percentage of "accomplishment" with the extended abdominal operation would be superior to the results obtained with the extended vaginal operation.

There is no doubt that the greater usefulness of the extended abdominal operation depends upon a greater accessibility. It is difficult to understand how contention can arise in reference to this between those who adhere to the vaginal operation and those who favor abdominal operation. The former even go so far as to declare that more vaginal and paravaginal tissue can be removed than by means of a laparotomy. That this is



not the case can be shown *a priori*. From above by a more liberal approach under full view and with the possibilities of freely exposing the ureters, it is self-evident more tissue of the parametrium can be removed.\* As far as the vaginal and paravaginal tissue is concerned, one needs to be reminded only that the total extirpation of the vagina does not succeed as readily from below as with a laparotomy, because the neighboring organs are more easily and more naturally liberated from above.†

Besides the possibilities of removing more of the parametrium the superiority of the abdominal route is shown by a greater access for the preparation of the parts to be removed, a fact which is of great importance. In many cases it is really of little moment whether more or less of connective tissue is removed. The better view that is obtained of the dissemination of the carcinoma, the precision and the clearness with which the diseased tissue can be extirpated, the exactness with which the preparation and isolation of the neighboring organs can be accomplished, is of great importance in cases where the cancer has greatly advanced. It is not so much the removal of much tissue, that is of importance, as the removal with neatness and precision of those parts that look suspicious and the separation of those organs surrounded by the cancer. From the very beginning I have made it a point that the extended abdominal operation has its greatest value, not because the regional lymph nodules can be extirpated, but because the parametrium can be removed and in advanced cases the greatly embarrassed organs can be liberated. It is now shown that the latter condition is the principal thing in this operation, and it is easily understood why those operators are disappointed, who open the abdomen only for the purpose of removing regional lymph nodules. Mackenrodt is of this same opinion in reference to this point.‡ He holds in discussing Schauta that with the extended vaginal operation those upper regions of the parametrium that are of greatest importance are not sufficiently within reach.

Another comparison comes to hand as far as the two operation routes are concerned, and that is the resulting injuries to the neighboring organs. By Schauta\*\* out of 336 operations the neighboring organs were injured in 10.4 per cent. Staude in 104 operations injured 11.6 per cent. while Zweifel (see Alhorn,

\* Z. B. Kromer, *Zeitsch. f. Geb. u. Gyn.*, Bd. lxiv, H. 2, p. 377.

† Wertheim, *Zentralb. f. Gyn.*, 1900, No. 52.

‡ *Zeitsch. f. Geb. u. Gyn.*, Bd. lxiv, H. 2, p. 371.

\*\* Intern. Congo. zu. Budapest, 1909

l. c.) in 357 injured only 4.5 per cent. and in 500 operations we injured only 6.2 per cent. It is an error to consider late ureter necrosis under operative injuries as Schauta would have it, as we explained in the section on ureter technic. That a relatively small proportion of ureter necrosis occurs in the extended vaginal operation, is due to the fact that the ureters are laid bare to a very limited extent, and even this limited exposure is not practised in every case (Staude does not do it at all). With the vaginal operation one cannot reach them. Furthermore, with the abdominal operation, with a better view, the injury to the ureters is at once recognized (seven times in our eight cases) while with the vaginal operation this can happen only under exceptional circumstances (Schauta recognized it once in eleven cases, with an unsuccessful implantation into the bladder). Lastly it is to be observed that a deliberate resection of the ureter has never been reported (an accidental injury is not a resection) with the extended vaginal operation.

Zweifel, also, had cases of ureter injury which were recognized and appropriately dealt with (excepting one case of constriction by implanting in the bladder).

Another advantage of the extended abdominal operation as compared with the extended vaginal operation, is that with a properly carried out technic, implantation (*impfrezidiv*) recurrence can be positively excluded. In the vaginal operation the exclusion of cancer particles and cancer juice from the field of operation remains uncertain. Schauta in his 258 cases had two positive implantations and Staude in his vaginal incision operation also had two in 104 cases; the same with Franz.\* In our 500 operations we did not have a single case of this kind and therefore Schauta is wrong when he says that the danger (*Verimpfung*) of cancer implantation is as great in the abdominal operation as it is in the vaginal operation. The two cases to which Schauta has reference† were very likely the result of insufficient technic. In the two cases of implantation recurrence in the laparotomy wound scar reported from the clinic of Jenner, it is impossible on account of the absence of a description of the operation to say if the technic was faulty or not.

The comparison of the operative mortality is by no means unfavorable to the extended abdominal operation. In our last 250 cases we had a mortality of 11.5 per cent. and it is not

\* *Arch. f. Gyn.*, Bd. ii, H. 2, p. 2 u. 14.

† Zurhelle, *Arch. f. Gyn.*, Bd. lxxxi; and Kussman, *Munch. med. Wochen.*, 1904, p. 1409.

infrequent for us to have a series of twenty to thirty operations without a death. Schauta shows an operation mortality of 10.7 per cent. and Staude 20 per cent. As far as the postoperative course is concerned, the extended abdominal operation holds its comparison favorably.

In the extended vaginal operation, the large wound in the pelvic cellular tissue becomes easily infected and phlegmon plays a conspicuous part in the disturbances of convalescence and no small part in the mortality.

Nor can one affirm that the extended vaginal operation is easier to learn or to perform than the extended abdominal operation; on the contrary, the vaginal operation is technically more difficult than the abdominal and for those less skilled, the control of hemorrhage and the difficulties of orientation in the preparation work are particularly hard to overcome.

Even though the extirpation of the regional lymph nodules, which is better accomplished by the abdominal rout, is of little concern in the opinion of others, nevertheless, we do not wish to exclude this part of the operation. There is, after all, something in the removal of lymph glands when we take into consideration that out of forty-one cases of carcinoma of the lymph glands, five cases remained free of recurrence after the five-year period and on the basis of this fact we positively assert that lymph-gland extirpation cannot be considered as superfluous in improving "later results." Alhorn\* reports five cases where carcinomatous glands were removed and after the five-year period the cases were free of recurrence. Lymph-gland extirpation cannot be considered as a dangerous complication to the operation, if one starts out with the principle that if the lymph glands are greatly adherent to the larger vessels, one must consider the case as inoperable and desist from further operation. If Schauta would have taken into consideration, that in the second half of our 500 cases, sixty-two had carcinomatous lymph glands, and from this number six (348, 393, 435, 488, 493, 494) died in the operation, he would hardly continue to hold to his opinion, that to search for glands during the operation is a dangerous procedure and that it burdens the percentage of mortality.

As has already been mentioned, an absolute extirpation of the regional lymphatic system is an impossibility. From the standpoint of principle it would be the proper thing, but practice shows that it cannot be carried out, and early in our experience

\* *Arch. f. Gyn.*, Bd. xcii, p. 242.



with the enlarged abdominal operation we limited ourselves to the removal of the enlarged lymph nodules only, and to this we still adhere in spite of the rude demand of Rosthorn, Mackenrodt and others to remove all of the glands, even the small unhardened nodules. To omit the extirpation of a regional lymph gland because from an anatomical point it could not be completely accomplished, would mean to "spill the child with the bath." In reference to the question of the lymph glands Mackenrodt approaches our view more and more,\* and we quote him as follows: "In spite of modern endeavor to secure an early operation, we do not often see the cases before there has been a regional metastasis. In the great majority of cases the condition will be evident at the time of operation if sufficient attention is paid to it. In the treatment of the regional lymph glands, only this principal can be of service, 'to do what is possible to examine each case with the greatest care, and to treat each case individually.' It is useless to consider all cases alike and to clear out thoroughly all glands and have twenty to thirty extirpated glands on the plate in order to prove the radical character of the operation." Recently† he goes even further than we do, by declaring that in cases which in his experience never suffer with carcinomatoses of the lymph glands (these are the cases with the infiltration form in which from a small focus the lymph channels of the uterus and parametrium have become hardened early in the disease, and cases of the climacteric period) he never even makes search for the same. It seems to us that this is a step too far because even with the abdomen open one is never sure that diseased lymph glands are not present, and the splitting of the peritoneum even up to the aorta and the palpation of the cellular tissue for enlarged lymph glands is after all but a relatively small addition to the operation. We believe with Kramer‡ that we should not attempt too much in the question of lymph glands, but should not omit to search for them in any case.

No abdominal operator will leave behind carcinomatous lymph glands or glands that are suspicious of carcinoma, in the hope that the glands themselves will eventually cope with the disease and overcome the cancer. The removal of such a gland costs him but a grasp. That under certain circumstances\*\* cancerous

\* *Zeitschr. f. Geb. u. Gyn.*, Bd. liv, p. 564.

† *Zeitschr. f. Geb. u. Gyn.*, Bd. lxiv, H. 2, p. 367.

‡ *Zeitschr. f. Geb. u. Gyn.*, B. lxiv, H. 2, p. 378.

\*\* Peterson and Colmers, *Beitr. zur. klin. Chir.*, Bd. vlüii, H. 1.



glands not removed at the time of operation and remaining latent can undergo spontaneous healing, is not to be disputed. But this must rarely be the case, as otherwise with the extended abdominal operation we would have had better later results in our cases with carcinoma of the lymph glands; as with the thorough operation the possibility of spontaneous healing of cancer outposts is at its best. Alhorn\* who points out that in extirpating five cancer lymph glands and leaving a sixth one behind, the prospect of a spontaneous cure of this one gland is more favorable than if all the six glands had been left. Alhorn distinctly declares that after the experience of Zweifel's clinic, he considers the extirpation of lymph glands a most important part of the extended abdominal operation.

#### H. CONCLUSION.

The extended abdominal operation has led to great activity in the operative therapy of uterine carcinoma. With the vaginal operation one soon reached the limit and this because of the fact that this route could furnish very little help in learning the pathology of uterine carcinoma. The vaginal operation could not possibly deepen our knowledge of the manner in which the carcinoma spreads itself from the primary focus. What can one expect in this direction from an operation which leaves in the dark the outposts of the carcinoma (using an expression of Leopold) and when the operation is ended leaves one undecided that the work done can be called radical. The vaginal operation for carcinoma of the uterus, in this sense must be considered unscientific.

The question in reference to the extended abdominal operation with its possibilities of complete survey is entirely different. It clears up many points that the vaginal operation could not clear and makes it possible to understand why in so many cases the vaginal operation could bring no results. Kromer is right when he says† that no operation but the extended abdominal one has stimulated our studies and increased our knowledge of cancer of the uterus. Aside from the fact that this operative method corrected many points in our former view, it has also brought to light material which histological and microscopical studies have put to good use. The extended abdominal operation has increased our knowledge of the manner in which the carcino-

\* *Arch. f. Gyn.*, 13d. 92, p. 250.

† *Monatschr. f. Geb. u. Gyn.*, Bd. xviii, H. 4, p. 68.

matous process spreads itself over the regional lymph apparatus and parametrium and has laid the basis for the possibilities and prospects of an operative procedure. The extended abdominal operation brought about activities which have resulted in new impulses even for the vaginal operation. There is no doubt that the indications for operation were held back by the vaginal method of extirpation of the carcinomatous uterus. At that time all gynecologists were of the opinion that it was too late to operate in cases where the parametrium was but lightly infiltrated and the movement of the uterus even slightly restricted. The histological investigations of the cases in the extended abdominal operation where parametrium was extirpated disclosed that not every infiltration was carcinomatous in nature, that even hard unyielding infiltrated parametria, are often free of carcinoma and, on the other hand, in many cases where the clinical examination reveals soft and yielding parametria carcinoma is found or at least the carcinoma has traveled or reached out to the lymphatic glands.

We are certain that if the men using the plain vaginal uterine extirpation method could have known and utilized such a knowledge they could have won excellent after-results. There is no doubt that many a case has been sent away that would have been greatly benefited by a simple vaginal uterine extirpation and it seems by no means excluded that by observing this point it will be possible to advance the boundary of absolute accomplishment, that is, when one considers the modern vaginal operation technic where, in many cases even without extended incisions, more parametrium tissue is removed than was done formerly, when for fear of bleeding and ureter injury the clamps were made to closely hug the uterine body.

When the vaginal operation received its impulse from the extended abdominal operation, individual operators resumed, with great energy, the so-called Schuchardt operation. That this operation has an extraordinary value cannot be disputed, nor is there a doubt present that the extended vaginal operation gives better results, than does the simple vaginal operation. Otherwise, however, even the extended vaginal operation always remains simply a vaginal operation and has the cardinal fault of not clearing up sufficiently the actual state of the disease. We hardly believe that the operation will prove a lasting one. This operation came as a time when one was afraid of the danger of the abdominal operation and it will be discontinued

just as soon as this danger is lessened. As the mortality of the operation by the abdominal route is getting continually smaller, one can affirm that this is already the case. In no way can the operation mortality now be an argument against the use of the extended abdominal operation.

For this reason, also it seems to me,\* there is no future for those individual operators who believe that the kind of operation is to be determined by the character of the carcinoma (for the cases with rapid advance and quick involvement of the parametrium and the regional lymph glands the extended abdominal operation and for the slower growing tumors the vaginal route) entirely overlooking the fact that the difficulties of differentiating the cancer cases in reference to their malignancy are exceedingly great.

The extended abdominal operation, however, has not reached the end of its development and usefulness. The ever-increasing command of the technic brings with it the ability to attack more difficult cases, lessens the mortality of the operation, and enables it to be carried through with greater energy. The value of this latter point should not be underestimated. We are not advocates of too extensive resections.† This is proven by the fact that we are still behind other operators in the number of operable cases, but our percentage is growing slowly. On the other hand, it seems of great importance to operate with exactness. Who can tell but—after one has declared against operation, on account of gland involvement—it will be possible to operate on these later cases of cancer glands, with more certainty and thoroughness than at the present time and so increase the number of operative cases and the proportion of favorable after-results?

We hope to prove this with our cases operated on so recently that they have not yet reached the five-year period. If we consider the cases that are too recent to be taken into consideration and have not reached the two-year limit, we find in the second half of our 500 cases forty-four that have suffered with carcinoma of the lymph glands. From this number three have died from the operation (348, 393, 435) one case (314) died of intercurrent disease, from the remaining forty cases seventeen have remained free of recurrence—that is, 42.5 per cent. (under these cases three have been observed more than four years, five for

\* Pfannenstiel, *Berliner klin. Wochenschr.*, 1905, No. 27; Kromer, *Monatschr. f. Geb. u. Gyn.*, Bd. xviii, H. 5; Rosthorn, *Kongr. zu Giessen*, 1901.

† Alhorn L. c. p. 251.

three years and nine more than two years) while from the forty-one cases in the first half of our number twelve remained free of recurrence after two years—that is, 29.2 per cent. This means a decided improvement which very likely will be the same after the five-year period.

Not only in the ever greater extension of the indications for operation, but also in the ability to operate with greater exactness do we see the possibilities of improving our late results. The thoroughness with which the operation can be carried out should be reached without increase of the operation mortality, because an extension of the indications for operations without such a result is not permissible (see also Franz and Zinsser, *Arch. f. Gyn.*, Bd. xci, p. 601, u. 612).

Besides this the demand of Winters should not be neglected that cases of uterine carcinoma should be operated upon at an earlier date, in order that we may better our percentage of case. We are, however, in accord with Zweifel and Veit,\* not too optimistic in our hopes that this end will be attained.

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## THE MANAGEMENT OF OCCIPUT POSTERIOR POSITIONS.†

BY

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WHEN a normal-sized head enters a normal pelvis with the occiput to the rear, if the head is well flexed and the necessary forces that enter into normal descent, rotation and expulsion are present, labor, in the majority of cases, will terminate in a spontaneous, normal delivery with but slight increase in its duration.

But because so many different factors are necessary to keep up the normal mechanism we find the posterior position of the vertex the most frequent cause of prolonged labor, increasing the demand for instrumental delivery ten-fold, and raising the mortality of the child from 4 to 10 per cent.

As interference on the part of the physician is absolutely called for in from 4 to 8 per cent. of these cases, a knowledge

\* *Prakt. Ergebn.* 2, p. 308.

† Read before the Alumni Society of Bellevue Hospital, May 1, 1912.



of the mechanism and forces entering into it is of utmost value in their proper management.

The vertex presents at the pelvic inlet in about 95 per cent. of all cases. In from 85 to 90 per cent. of these cases the long diameter of the head enters the pelvis, before or during labor, in the right oblique diameter. The head favors this diameter owing to the fact that it is larger than the left oblique, which is encroached upon by the sigmoid and rectum.

The back of a child is more apt to face the front because the concave abdominal surface of the child adapts itself to the convex surface offered by the lumbar spine of the mother, thus allowing the occiput to enter anteriorly in about 60 to 65 per cent. and posteriorly in from 30 to 35 per cent.

A well-flexed head in a normal pelvis enters the brim with its shortest diameter suboccipitobregmatic, in the same manner whether occiput is to the front or rear.

The occiput being the most dependent part strikes the pelvic floor first and by force of the uterine contractions above and the resistance below, follows the curved slope of the pelvis and is rotated downward and forward and inward, until it reaches the under surfaces of the symphysis.

To accomplish this rotation the occiput in anterior position must rotate 45 degrees as against 135 in the posterior position.

The occiput rotates anteriorly without much delay in a large majority of the cases, because of the firm resistance below and strong force from uterine contractions above. The combined action of these two forces tends also to keep the head well flexed, allowing in this way the smallest diameter of the head to accomplish the descent with its greater degree of rotation.

For this mechanism to succeed in a normal manner with no undue delay in the course of labor the membranes must be intact. During labor, and before rupture of the membranes, the liquor amnii serves an important function. It acts as an aid to rotation, as a reflex stimulant to uterine contractions, and as a dilator of the cervix.

It aids rotation by maintaining flexion and lessening resistance. When the uterus contracts the pressure in the liquor amnii is increased. The presence of this fluid under pressure between the head and the uterine segment below increases the resistance which is necessary to maintain flexion, and at the same time exerts lateral pressure on this part of the uterus by means of which resistance to rotation is lessened.

The lateral force of the hydrostatic bag in the external os acts as a reflex stimulant to uterine contractions, and at the same time as a dilator of the cervix.

In the normal anterior position the head fits snugly into the lower uterine segment, because it is directed in the normal axis of the pelvis. During the contraction of the uterus this allows of equal distribution of pressure to all parts of the bag of waters.

Owing to the malposition of the head which is found in occiput posterior position, with poor flexion, there is a great tendency during uterine contraction to early rupture of the membranes. This early rupture of the membranes is observed in other presentations, as breech or transverse.

In 1000 normal anterior positions at the Manhattan Maternity Hospital, the membranes were found to be intact at the beginning of the second stage in 60 per cent. of the cases, while in 400 cases of posterior positions the membranes were found intact at the beginning of this stage in only 43 per cent. In posterior cases where membranes ruptured in the first stage, 40 per cent. were at the onset of labor, while in the normal anterior cases labor was well advanced before rupture took place.

In posterior positions early rupture of the membranes is more common in primipara. In eighty-two cases in primipara the membranes ruptured early in the first stage in fifty-three, or 64.6 per cent. While in eighty multiparæ only thirty-three or 41 per cent. gave a history of early rupture of membranes.

Duration of both stages of labor was much longer in posterior than in anterior positions. In 1000 cases of occiput anterior, the duration of the first stage, in primiparæ, was thirteen hours and ten minutes; second stage, one hour and thirty minutes, while in 400 cases of occiput posterior in primiparæ, duration of first stage was sixteen hours and thirty minutes, and second stage, two hours and ten minutes, a difference of three hours and twenty minutes in the first stage and forty minutes in the second stage.

In multiparæ with occiput in the anterior position duration of labor in the first stage was eight hours and thirty minutes; second stage, one hour and eleven minutes. Multiparæ with occiput posterior first stage eleven hours and thirty minutes, second stage, one hour and forty minutes, a difference of three hours and ten minutes in the first, and twenty-nine minutes in the second stage.

The prolonged labor in posterior position, then, is due to the difficulty of the increased diameter of the head in rotating, and also to another factor, namely, the great difficulty of the cervix in dilating.

This slowness and at times failure of the cervix to dilate is due to two factors, early rupture of the bag of waters, and malposition of the head.

In occiput anterior, we have all conditions present which favor dilatation of the cervix. On the other hand, in occiput posterior, we have the loss of the hydrostatic wedge in the rupture of the membranes, and what is of more importance the malposition of the head which causes the force of the uterine contraction, transmitted to the fetal axis, to be directed away from the true axis of the cervical canal.

This maldirection of force causes a stretching of the uterosacral ligaments. The maternal suffering in these cases, referred mostly to the back, is caused by the undue tension on these ligaments.

The relaxed pelvic floor in multiparæ is a frequent cause in prolonging labor, for by lessening the resistance below it tends to retard rotation.

In 251 cases of occiput posterior in multiparæ this was a cause of delay in eighty cases. Most of these were in tenements and delivery in previous labors by midwives had resulted in lacerations which caused this relaxation.

In from 2 to 4 per cent. of occiput posterior cases we have the occiput rotating into the hollow of the sacrum. This occurs when failure of force above or lack of resistance below allows the flexion of the head to unfold and the sinciput first strikes the pelvic floor and is, therefore, rotated beneath the symphysis causing the occiput to seek the hollow of the sacrum. This is known as persistent occiput posterior. Only a few of these cases are ever delivered from this position spontaneously. To accomplish this we must have a small head and a relaxed perineum; then powerful pains, the head being flexed, may force the child through the vulva.

Another method that rarely occurs is changing to a face presentation, and a birth resulting from extension. There was one case of this type of delivery in 6000 at the Manhattan Maternity Hospital.

In the management of occiput cases if we keep in mind the fact that adequate flexion of the head is of utmost importance

and that poor flexion is very apt to cause prolonged labor we are better able to manage the case and bring it to a successful termination with the least possible harm to mother and child.

Diagnosis of this position before labor is uncertain and not much can be done in bringing about rotation at this time.

Where the abdominal wall is thick or rigid, or if there be an excess of liquor amnii, it is often impossible to make out the fetal parts by palpation. The fetal heart is an uncertain and unsatisfactory guide to the location of the fetal back.

In primiparæ in a few cases, even in normal pelves, where the occiput is to the rear and the head is poorly flexed, we find the head will not engage in labor.

Posture in the lateral or knee-chest positions has frequently been recommended, on the principle that rotation may be brought about by force of gravity. Unfortunately the results are not often satisfactory.

As soon as labor begins it is important that diagnosis of position be made. As the abdominal examination is unsatisfactory we must rely on vaginal palpation to help us in forming our diagnosis.

If we can make out positively the location of either fontanelle and the direction of the sagittal suture, this is all that is necessary. But in these cases owing to early rupture of the membranes the caput succedaneum forms quickly and makes palpation more difficult. Again, the head in the later stage is so moulded that only the most experienced can make out the position without inserting the hand and feeling an ear.

The clinical picture offered by these cases especially in primiparæ where we have the membranes rupturing at the onset or early in the first stage, the slow onset of the labor with nagging, weak and ineffectual pains continuing for several hours, later becoming stronger and characteristically more painful than in any other type of labor, exhaustion of the mother from long labor and constant backache, and the slow dilatation of the cervix, all these should make us more than suspicious of the type of labor with which we have to deal.

With a knowledge of this position present, it should be our endeavor to prevent early exhaustion and to shorten the duration of the labor by every means in our power.

The weak and infrequent pains at the early stage may be stimulated by keeping the patient walking about, or even in a sitting posture. Strychnine, 1/30 grain, and quinine 5 grains, are



often effectual at this time. They may be repeated every three hours until pains are strong and frequent.

If membranes have ruptured and the head is not in the pelvis far enough to prevent the loss of fluid the patient should be kept in a prone position until the head is well engaged.

The introduction of a modified Champetier de Ribes bag at this stage is of advantage in preventing undue loss of liquor amnii, in stimulating the uterine contractions, and in dilating the cervix.

Therefore, the bag is of advantage where the head is high in the pelvis. Here the cervix is much slower in dilating and the escape of liquor amnii much greater.

By preventing the escape of liquor amnii from the uterus we protect the child from the effects of prolonged labor, and if version becomes necessary it may be performed with less danger of rupturing the uterus.

The patient should not be encouraged by the nurse to bring her voluntary muscles into play until the head is well down in the pelvis and the cervix dilated, at which time the contraction of the abdominal muscles increases the force from above and the contraction of the iliopsoas muscles when the thighs are flexed, is of advantage in aiding rotation.

The early use of the voluntary muscles can accomplish little toward dilatation of the cervix and only tends to exhaust the patient.

If after the pains have continued for 8 to 10 hours without any apparent change in the cervix, and the patient is tired and anxious at the delay, good results usually follow the administration of morphine  $\frac{1}{4}$  grain and the injection by rectum of chloral hydrate 20 to 30 grains in 4 ounces of hot milk.

This usually allows the patient to sleep from three to six hours in most cases, and the cervix is often found to be much softer following the action of these drugs.

After the head is well down in the pelvis and the pains are strong and frequent, progress of the labor may be helped by increasing flexion. This is done by inserting two fingers into the vagina and pushing up on the frontal portion of the head during a contraction. The cervix may likewise be stretched during a contraction without much discomfort to the patient. In the majority of cases this is all that will be necessary to enable the patient to deliver spontaneously.

In another class of patients where the head is well down in

the pelvis, and in spite of strong pains extending over several hours, there is no change in the cervix, small quantities of chloroform during the height of the pain will be of great advantage in lessening the exhaustion of the patient and aiding in the progress of the labor.

In some cases rotation can be brought about after the cervix is partially dilated by inserting the hand into the vagina, grasping the head in such a way as to increase flexion and at the same time pushing upward to forcibly rotate the occiput to the front. During this procedure with the other hand on the abdomen, the anterior shoulder should be rotated toward the median line of the abdomen. If the head is held in this position during two or three pains rotation may become complete.

Before attempting manual rotation it is advisable to make sure of the diagnosis by feeling an ear.

Where manual rotation with flexion is attempted spontaneous delivery is more apt to follow in multiparæ cases. In eighty multiparæ where labor was delayed and manual rotation and flexion was used, sixty-five delivered spontaneously, while in eighty-two primiparæ with the same treatment, forceps were necessary in forty-seven cases.

The long duration of the labor and the severity of the maternal suffering is very apt to lead one to attempt delivery too early, but if we try to terminate labor before the cervix is fully dilated, we risk producing deep lacerations in the cervix, and increasing fetal mortality, but where there are definite indications of serious exhaustion on the part of the mother, or secondary uterine inertia, or changes in the rate of the fetal heart, labor must be terminated without regard to the condition of the cervix.

In 400 cases of occiput posterior at the Manhattan Maternity Hospital, 162 cases failed to rotate. Of these spontaneous delivery occurred in eighty-five following manual rotation with flexion, forceps were necessary in seventy-one and version in six.

The method of delivery in these cases depends mostly on the location of the head in relation to the pelvis, and in considering these we divide the cases into three classes. The first class of cases where the head fails to engage, "the floating head." The second class where the head is engaged at the brim, and the third class, which includes the great majority of these cases, where the head is in the pelvis.

In the first class of cases, where the head is free above the

brim, we have the most difficult problem in obstetrics to encounter.

We have two methods of delivery in these cases—high forceps or version. High forceps where the head is free above the brim is not only a difficult operation but is always dangerous for both mother and child.

Where one has not had much experience in the use of high forceps, version is much less dangerous to the mother but the chances for the child are much better when forceps are used.

In complicating flat pelvis or where there is marked prominence of the lower lumbar vertebræ, version offers best chances for both mother and child. In such cases version should be elective.

Where high forceps were used in five cases in this class complicated by flat pelvis, only three were able to be delivered by this means and resulted in two stillbirths. In the other two cases where version was necessary, forceps failing, one of these resulted in a stillbirth.

In using high forceps we have two methods of application. In the first method the head is manually rotated to bring occiput as far anterior as possible and at same time flexion is increased. The forceps are applied to the sides of head, making a cephalic application. The other method is to apply forceps to the head without regard to position, pelvic application.

Before deciding on a method of delivery in these cases, we should first make a careful examination of the pelvis and condition of lower uterine segment while patient is under deep anesthesia. It is only under such conditions that we are able to recognize any deformity in the pelvis or lower lumbar vertebræ and exact condition of the uterus.

If the uterus is tonically contracted or the lower uterine segment thinned out it is a difficult and dangerous procedure to attempt any rotation of the head before applying forceps. And under these conditions version would also be contraindicated because of danger of rupturing the uterus.

Even in most experienced hands rotation at the brim is often unsuccessful, and as we may have to fall back on version, if forceps fail, it makes this procedure much more difficult and dangerous by the loss of liquor amnii.

Although the primary rotation of the head, before application of forceps, is the ideal method and gives best results in the hands of those who most frequently use forceps, nevertheless, the

pelvic application is the much safer method. Here the forceps are applied to the head in posterior position and by traction head is brought well down into the pelvis. If axis traction forceps are used, in some cases, rotation will take place during the descent otherwise the forceps are removed and the head delivered in same manner as the third class cases.

In the second class, where the head is engaged at brim, we have same methods of delivery as in floating head. But in this class version should never be elective. Where we have a flat pelvis, forceps should be applied first and if after moderate traction, using axis traction forceps, there is no advance, version offers best solution of the problem.

In regard to the method of application of forceps in this class the best results are obtained by primary rotation of head to allow cephalic application. This is done by inserting one hand into vagina, grasping the head in such a manner so that it is flexed and at the same time raised out of pelvis and rotated to the front. During this manipulation with the other hand on the abdomen, the anterior shoulder is forced toward the median line. By having an assistant exert downward pressure on the fundus, the head can be held in this position until a cephalic application is made.

To one not experienced in intrauterine manipulation there is danger of rupture of uterus, loss of liquor amnii and prolapse of the cord.

In the other method forceps are applied to the head without rotation and by traction it is brought well down into the pelvis. The forceps are removed and head delivered as in the third class of cases, double application.

Most cases come under the third class where the head is well in the pelvis.

There are three methods for delivering the head in this position.

We may deliver the head without rotation with occiput to the rear. This method usually results in deep lacerations of the perineum and should not be used unless rotation by the other methods fail or where there is a moderate size head and the perineum is relaxed from previous lacerations.

The most successful method in delivering these cases is to make a cephalic application after the head has been flexed and partially rotated manually. Rotations then is completed by traction and gradual rotation with forceps.

The third method is rotation by forceps alone. Where we have



difficulty in keeping head partially rotated the head may be completely rotated by use of the forceps.

In this method the head must be well down in the pelvis, well flexed, and the cervix dilated or dilatable.

The forceps, preferably solid blades, are applied to the sides of the head. The head is then rotated by making the handles follow the direction of an arc of a circle and not rotated from the median line, thus preventing ends of the blades from tearing the vaginal wall. This movement of the forceps in rotating should be slow and gradual. By keeping two fingers on the sagittal suture of the head we are able to follow the rotation. When the head has been rotated the forceps are removed and reapplied to deliver the head by traction.

In the 400 cases of occiput posterior analyzed there was one maternal death making mortality of .25 per cent.

There were ten fetal deaths, mortality 2.5 per cent. Of these six were in forceps cases, three cases were complicated by flat pelvis and one by a generally contracted pelvis. Of the four cases delivered spontaneously, three deaths were due to prolonged labor under charge of midwives before being turned over to the Hospital. Delivery in these cases occurred within a very few minutes after the head had been flexed and rotated manually. There was one death due to congenital syphilis.

#### SUMMARY.

1. The prolonged labor in occiput posterior positions is due to early rupture of membranes and maldirection of force.
2. Prolonged labor is more common in primiparæ.
3. In primiparæ with vertex presentation, early rupture of membranes is a very suggestive sign of occiput posterior positions.
4. In occiput posterior with poor flexion spontaneous delivery can only occur after a long labor with strong pains.
5. In multiparæ relaxed pelvic floor is often a frequent cause of delayed rotation.
6. In primiparæ early rupture of membranes is the principal cause of prolonged labor.
7. Double application of forceps offers the best methods of delivery where the head is high in the pelvis.
8. With floating head, if not contraindicated, version offers the best solution in a flat pelvis.
9. With head low in pelvis, partial rotation by the blades is the best method.

# SOME REFLECTIONS AFTER TWENTY-FIVE YEARS OF PRIVATE PRACTICE IN OBSTETRICS.\*

BY

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THE following discussion is not intended as a profound exposition of any subject in obstetrics; I wish merely to touch lightly on some matters, basing my remarks on an experience of twenty-five years in the private practice of obstetrics in San Francisco.

I was initiated into the noble art of midwifery years ago in Munich by Professor Hecker. First impressions are lasting. I shall never forget my first examination of a pregnant woman. Hecker had strung out a number of them with their backs to a wall; before each one on the floor was a pillow and the student, in fact every examiner, had to kneel down before the woman and introduce his finger into the vagina in this position. My real training in obstetrics I received in Erlangen under Professor Zweifel, first as student, then as second, and finally for one and a half years as first assistant to the chair of obstetrics and gynecology of the university.

There is no better opportunity anywhere to train and fit oneself for work, not only in obstetrics but in all branches of medicine, than the position of an assistant, especially of a first assistant, to a German university clinic; every case is worked with scientific thoroughness and all work is done under exacting conditions: correct diagnosis, strict adherence to indications, perfect technic is demanded, besides, some teaching is done.

After a short stay in the country and in the suburbs of Frankfurt-on-the-Main, my native city, where I attended to a number of difficult labor cases in the practice of midwives, I came to San Francisco in 1886.

It was my good fortune soon to be engaged in an active obstetric practice and I was fortunate to have my clientele among the intelligent and well-to-do.

\*After an address delivered before the San Francisco Med. Soc., March 2, 1912.

It is impossible for me to give any statistical data of the work done in the twenty-five years since all records of my cases were destroyed in the great disaster of 1906. The work I have done as a physician was to the greatest extent either directly or indirectly linked with the gravid condition of woman; cases of early pregnancy, miscarriages, extrauterine pregnancies; complications of pregnancy, of delivery, of the lying-in period; the sequelæ of miscarriages and delivery: lacerations, displacements, inflammatory affections of the pelvic organs—those cases seen in my own practice, in the German Hospital, in the San Francisco Polyclinic, in consultation, number many thousands. The cases where I was engaged and where I attended at delivery either at term or in the second half of pregnancy, the ones that will form the basis of my remarks are not so very numerous, as I have stated it was “quality” and not “quantity” in my private work; if I estimate the number of the latter cases, at term and in the second half of pregnancy in my own practice, on my records since the fire and on my recollections, I think that they will reach between fourteen and fifteen hundred.

When an intelligent woman has missed a menstrual period or two she will visit a physician not always in a joyful mood and not always with the best intentions; but when she has decided to have a baby, this early visit enables the accoucheur to carry out an excellent hygiene of pregnancy, so very important for a successful delivery.

I have always considered pregnancy a physiologic condition and delivery a physiologic function and my advice to gravid women has been to live as usual, to do everything in moderation, no excess in work or exercise.

With the nausea, vomiting, malaise, a change in nutrition usually takes place and the consequence is that the woman becomes constipated. So many then resort to strong purgatives and from that period of their life become addicted to the habit of cathartics. I have always tried to combat constipation, an early subjective sign of the gravid condition, through diet and with mechanical means, but at times have to resort to mild cathartics.

When I have found a pregnant woman sound and healthy; when the examination of her urine shows a normal condition, then in my opinion all that is required to do is to make a routine examination of the urine from time to time. I have always considered of greatest importance the quantity of urine passed.

I have seen several cases with 6 per cent. of albumen (Esbach); with casts and edema, but with large quantities of urine, go through pregnancy, delivery and the puerperium without any difficulty; in two cases the newly-born had convulsions, one of whom died in convulsions. If the gravida continues to be nauseated, if vomiting persists, if headache is present and other symptoms indicate that metabolism is disturbed, then certainly resort should be had to other examinations than the routine test of urine.

In all these years I was compelled only once to induce labor on account of insufficiency of the kidneys endangering the life of the gravida. In three cases eclampsia occurred among my clientele, twice in pregnancy.

When we discuss different matters with the gravida, the question of nurse comes up. When I first practiced in San Francisco there were very few trained nurses here; a woman who had borne children, who had acquired some practical experience, the so-called practical nurse, was all we had; they are still in great demand. In ordinary cases when everything runs smoothly they are efficient, but if real nursing in sickness is required, they fail. Fortunately trained nurses are now to be had. We require of a good nurse: training, common sense, tact; if this is essential of every nurse, these qualities are indeed needed to make a good obstetric nurse and when you have such a one, you have a jewel. "Many are called but few are chosen." This is my personal experience.

Another question that comes up in these later years is the question of a hospital, or sanitarium. I am fully aware of the many advantages of a hospital delivery; but if a woman has a comfortable home, if we expect a normal delivery, I cannot see any reason why we should insist upon her going to an institution. I have attended to most of my confinements in private houses; I have managed all sorts of complicated cases in the home and have no reason to regret it. I deplore the tendency to deliver women in hospitals; in my opinion this tendency is another factor to destroy the family, the home-life; it is in keeping with the tendency to live in those abominable apartment houses, where thirty, forty and more so-called families are herded under one roof; it is in keeping with the present lamentable tendency of women to rush into public life, as manifested by the suffragette movement.

When once at the bedside of a woman in labor, I have always



liked to remain until the baby is born. I do not consider it under my dignity to assist in any way possible the poor woman in her hours of anxiety and suffering. It is a great assistance to tell them how to bear down and much good has resulted in my practice from those little maneuvers.

Chloroform is given liberally without fear or prejudice. Gradually the anesthesia is pushed so when the head is delivered, the parturient is either fully unconscious or in a state where she does not suffer and still is open to commands to bear down or not to bear down. In this way I am able to shell out the head even of large babies in the interval of labor pains, the only effective way to protect the perineum that I know. I have delivered large babies, of 10 pounds, without a tear; certainly in others, no matter what we do or how skilfully we manipulate, the perineum is bound to tear. In no case have I had a complete laceration.

When the baby is born and handed over to the nurse, I like to finish the case; the uterus is gently rubbed and with a good contraction gentle pressure is made upon the uterus; at the same time the parturient is told to bear down and in this way in most cases the placenta is delivered. But sometimes it will not appear. I have waited one hour, two hours and when I finally inserted a finger in the vagina to examine I found the placenta wedged in the cervix; with a slight pull on the placenta it comes down into the vagina and out. For many years I have now adopted a little help whenever the secundines do not come readily. If there is delay, I twist the cord around my finger, and while pressing on the uterus, a slight pull on the cord is made. Absolutely no harm can or does result if the traction is made as described; I claim two advantages for this method: (1) Speedy delivery of the secundines; (2) In the cases where the placenta is wedged in the cervix and where we finally succeed in pressing it out, I have found that the placenta folds itself on the fetal side and that the membranes tear off easily and are left behind; if a slight traction is made, the folding of the placenta takes place upon the uterine side and the membranes come in toto.

In all my cases I was able to deliver the secundines spontaneously with the exception of one case, where I had to deal with an adherent placenta, that had to be peeled off.

A careful inspection of the secundines is always made; in no case has a piece of the placenta been left; but in several instances pieces of the membranes or the whole membranes were left; when in my judgment a larger piece is missing (and it depends

entirely upon our judgment what is a larger piece of membrane) I always look for it and remove it.

The next step is the inspection of vulva and vagina. I invariably wash the freshly delivered woman myself, exposing everything to my view and suturing at once lacerations of perineum and vagina.

In the lying-in period I have managed my cases without falling in with any of the transient fads so frequently recommended to us. I have neither kept a woman on her back for days nor have I insisted upon her getting up on the second or third day postpartum.

I allow freely moving about in all positions; if a woman wishes to leave the bed after a week, she may do so; if she wishes to take a rest of a month, I do not object. My aim and object has always been to give the lying-in woman a rest of body and mind and to gradually lead her back to her usual life, adding step by step a little every day. If besides this, exercise of the abdominal and perineal muscles is carried out, the puerpera will never feel looseness or weakness, when she begins to be on her feet.

As far as nursing is concerned, I insist on putting the baby to the breast as soon as the mother has rested and the baby is hungry. I have no set rule; if the baby is hungry four hours after his arrival and the mother is ready, the baby is put to the breast; if the baby sleeps for twenty-four or thirty hours, it is not disturbed. If you put a sleepy baby without hunger to the breast, it will not take the nipple and the attempt to make a sleepy baby take the breast creates nothing but nervousness for all concerned; but if the baby is hungry I have never as yet seen it refuse to take the nipple.

Some women have not a drop of milk. I have seen women well formed, with well-developed breasts and nipples, without any milk whatsoever, notwithstanding that every effort was made to produce milk. In other instances the initial free supply of milk soon vanishes when the mother begins to move about. But not a few have I seen who were able and delighted to nurse their offspring six and eight months, devoting themselves entirely to its care and welfare, representing the finest type of womanhood.

I do not wish to enumerate all the different complications that I have met in my practice; I have reported before you and elsewhere from time to time interesting cases.

In looking over one's practice in a general way the following points are of greatest interest:

1. Mortality of the mother.
2. Morbidity of the mother.
3. Mortality of the fetus.
4. Morbidity and injury of the fetus.

No matter how carefully and attentively we may manage our confinement cases, some babies will be lost; some of them die during the progress of labor and others are born dead; we know they are dead from our observations but we are unable, even after they are born, to ascertain the cause of death.

Others are born asphyxiated from one reason or another and we do not succeed in starting respiration; I have had my share of these cases. But I was fortunate not to injure any of the babies that I delivered and I was fortunate not to see any gross malformation.

As far as mortality of the mother is concerned, the most important of all things in midwifery, I am able to state, that up to the present day, the second of March, 1912, I have not lost a single mother in my own obstetric practice during the whole time of my professional work here in San Francisco.

There is certainly an element of good luck in this fortunate record; if you meet a nasty case of placenta previa, or of eclampsia, or of thrombosis, no matter how careful you are and how skilful your management of the case, you are apt to lose a mother. But I believe that some credit is to be given to my efforts and there are two things to which I ascribe the good results:

1. Strictest antisepsis.
2. Strictest observance of indications.

These two principles I learned at the University clinic in Erlangen from Professor Zweifel. This gentleman was one of the very first to apply Lister's ideas to obstetrics; he was a fanatic on antiseptic measures. Besides he was an admirer of Semmelweis and his teaching induced me to acquire a copy of Semmelweis' work "*Begriff der Aetiologie u. Prophylaxis des Kindbettfiebers*" one of the most wonderful, fascinating books ever written by any medical man. Its reading impressed me for life-time with the great responsibility of an accoucheur.

My efforts have always been directed toward personal disinfection, that is to understand disinfection of myself and I certainly have not infected one single woman of my clientele.

I have not escaped infectious affections in the lying-in period. When labor is protracted it is impossible to avoid the importation

of the ubiquitous colon bacilli, or of the staphylococci from the vulva into the genital tract, the change of the vaginal flora from a harmless to a virulent character and the inoculation of these germs into tears, lacerations, erosions of the vaginal outlet.

But the lesions brought about in this way are amenable to treatment and entirely different from Semmelweis' inoculation of "decomposed animal matter," which translated in modern parlance is "Infection by virulent bacteria, carried through finger, hand or instrument of accoucheur from outside sources to lesions in the genital canal."

No greater calamity is to me conceivable than to lose a mother from outside infection.

The other great lesson of Zweifel's clinic was: No interference in the progress of labor, unless distinctly indicated; no forceps par complaisance; no polypragmasia; careful observation and prompt action when indicated.

I have religiously conserved in my mind the lessons of early training and have not been lead astray by glaring reports of "frenzied obstetrics," so often published in these later years.

I conclude my remarks with the expression of thankful remembrance of the days of the University clinic of venerable Erlangen.

1054 SUTTER ST.

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## MENSTRUATION, NORMAL AND ABNORMAL.\*

BY

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It will not be possible within the limits of this short paper to enter into a full and free discussion of the subject, and so we shall confine ourselves to the more interesting features treated from the standpoint of scientific diagnosis and therapeutics. It is more or less difficult for a gynecologist to present to the profession a paper of general interest which has not been already thoroughly threshed out in the literature, and you have, doubtless wondered at my temerity in preparing a paper on a subject as old as Eve herself.

Since menstruation is such an every day affair and since its abnormalities are so common any effort to throw new light upon its physiology or offer new weapons to fight its pathology should

\*Read before the Medical Association of Georgia, Augusta, April, 1912.



be encouraged. No claim for originality is made, I merely have gathered some, not widely known facts from the literature and some few from personal experience.

In the first place we must look upon normal menstruation not as a local phenomenon but as a more or less local manifestation of a general metabolic process. The older views as to the physiology of menstruation were based on the "local" theories. The ovulation theory which maintained that menstruation was a direct result of the ripening and rupture of a Graafian follicle is now quite discredited, as is the "freshening theory which held that menstruation was a process of freshening or preparation of the uterine cavity for pregnancy. The monthly abortion idea is also untenable since we know menstruation may occur without the presence of a ripe ovum. We know of course that the presence of ovarian tissue is necessary to menstruation, but that of itself is not sufficient, and we are compelled to look further for a solution to the problem.

Stevenson in 1882 advanced the so-called menstrual wave theory which contended that the metabolic processes in women presented a distinct rhythm gradually increasing in intensity up to the time of the menstrual flow, when they suddenly dropped and reached their lowest point. After this they gradually rose again and attained their maximum intensity just before the next menstrual period, thus indicating that the entire process was under some control and that neither menstruation nor ovulation was directly dependent upon one another but upon some general and as yet unknown cause. Johnston, Webster, Otto and others accepted these views. Blair Bell of Liverpool has recently interested himself in the subject and has come to this conclusion which I quote from his text-book.

"Every thing—every known fact and all the recent experimental work lead us to the conclusion that we must seek for some general metabolic change to account for menstruation."

Calcium metabolism is concerned in this function which does not commence until the child has grown to puberty and has laid down her bony framework, and only recurs when there are no other claims on the calcium economy of the subject. Whether these views be correct or not, they are probably not the whole truth for it is extremely probable that the ductless glands one and all play an important part in the genital functions and in controlling the calcium metabolism itself. There is direct evidence that this is so in the case of the pituitary body, the thyroid

and ovarian glands, and strong presumptive evidence in regard to the adrenals, for the extract of these has recently been shown to influence favorably osteomalacia, a disease which was formerly treated by oophorectomy." Mr. Bell has done some very beautiful experimental and clinical work upon which he bases his conclusions, and has devised an instrument called the calcimeter to estimate the calcium content of the blood. He finds that menstruation is a periodic function only in so far as the calcium metabolism is in harmony with this periodicity and that the function is dependent upon the calcium metabolism in all its ramifications. In determining the calcium content or rather index of a patient's blood, a measured quantity is treated with a given solution of oxalic acid and after a dilution with glycerin, acetic acid and distilled water, the calcium oxalate crystals are counted on an ordinary blood counting slide. Whether or not the method is quantitatively accurate is unimportant, though we believe it is, for all we want is a relative determination for comparison and this is furnished without doubt.

One can with this apparatus make hourly or daily determination of the calcium index.

Dr. Kelly kindly loaned me his calcimeter and while the method sounds simple, I have found practically the technic requires considerable practice even to identifying and counting the crystals and up to this time I am not sufficiently expert to draw valuable conclusions from the little work I have done with it.

It is necessary that we go rather thoroughly into the physiology of normal menstruation before taking up its various abnormalities, for it is just here that we have been so woefully lacking in the past. We have treated the various menstrual disorders symptomatically and empirically, without getting at the real cause, and so in many cases our treatment has been unsatisfactory to the patient and to ourselves. Especially has this been so in those cases with apparently normal pelvic organs, and as a considerable proportion, 75 per cent. according to Theilhaben, of the sufferers of dysmenorrhea, belong to this class, our attention is naturally drawn in this direction.

What then is menstruation? and upon what does it depend? Menstruation is a phenomenon occurring during the reproductive life in woman whose most obvious sign is the periodic discharge of blood from the uterus.

Until recently it was thought to be a phenomenon peculiar to the human race. We now know that "rut" or "heat" of the

mammalian females is comparable to human menstruation, and much has been learned in regard to the nature of this function.

Menstruation begins between the ages of twelve and fifteen years at the period known as puberty. At this time certain general changes take place in the girl both in regard to her mental and physical characters which are quite familiar to all of us. While some metabolic processes are producing these wonderful changes in character and disposition others equally remarkable are producing changes in the bodily structure.

Exactly what metabolic changes are producing such wonderful results are not as yet known. It is clear, however, that the ductless glands are all more or less involved. The thyroid being the only one capable of observation has long attracted our attention by its enlargement before and during menstruation. From experimental work carried out by Bell and others it is quite probable that the calcium metabolism under direction of the ovaries and other ductless glands is also concerned in the phenomenon of menstruation. In addition to the activity of these ductless glands in order to have normal menstruation we must have a good state of bodily health and sound pelvic organs. Any derangement of these necessary factors, if severe enough, will produce the various menstrual disorders which we are now in a position to consider intelligently. A careful complete history and a thorough physical examination is of course required in every case. In regard to the examination let us protest against the vaginal examination of young virgins unless a general anesthetic is used.

It is not necessary to detail the various forms of menstrual disorders for they are given in all the modern text-books on gynecology. Suffice to say that a considerable percentage of amenorrhea, menorrhagia and dysmenorrhea are due to general rather than local causes. Consequently in order to institute rational treatment we must if possible make an accurate diagnosis. This is by no means easy and will call into play our most acute diagnostic powers. In many cases we have to experiment to see whether or not the condition is due to hypo- or hyperthyroidism, pituitary or adrenal derangement or ovarian deficiency or disturbance in calcium or iron metabolism. When we begin to realize that dysmenorrhea, amenorrhea, etc., are symptoms not diseases we are on the right tract and shall cease to content ourselves with using the usual antispasmodic and anodynes except as a last resort.



Among these newer therapeutic agents at our disposal may be mentioned calcium chloride 30 grains daily, or lactate in the same or even larger doses. Thyroid extract, grains 3 to 10 daily. and infundibular extract are also recommended. Just how these glandular extracts act is not well known, though probably by their effect upon the vasomotor system, involuntary muscle and general body metabolism. In an article on dysmenorrhea, published in *The Journal of the Medical Association of Georgia*, December, 1911, I reported two cases of dysmenorrhea, one with hyperthyroidism treated with calcium lactate grains 10 t. i. d. with complete relief from symptoms. Owing to the associated symptoms of hyperthyroidism a partial thyroidectomy was done. I have just learned that since her operation despite the continued calcium treatment her dysmenorrhea has returned. It is quite probable that she needs thyroid extract in addition to the calcium until her metabolism adjusts itself, and at her next period I shall try it.

Several other cases since the reading of my paper have been verbally reported to me where complete relief followed the use of calcium after other drugs had failed. Another case was relieved by one grain doses of thyroid extract given thrice daily. She had also been through the mill of suspension operation and the usual anodynes without help.

Cases depending upon pelvic lesions should be surgically treated according to the condition found, and will not be considered here.

To summarize:

1. Menstruation is in general not a local phenomenon.
2. It is dependent upon a good state of bodily health, activity of the ductless glands, and normal pelvic organs.
3. Any derangement of these necessary factors if sufficiently severe may give rise to menstrual abnormalities.
4. In a large majority of menstrual disorders no demonstrable pelvic lesion can be found.
5. In the treatment of many forms we may give relief by the use of calcium salts and the various glandular extracts after securing a good state of general bodily health.

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## PREGNANCY IN A BICORNATE UTERUS.\*

BY

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CASE report by Dr. Frick. The patient is forty-two years old; married, and has three children, aged twenty, seventeen, and fifteen. No abortion. On December 10 she decided that pregnancy had again occurred, basing her belief on the symptoms being the same as in her three previous pregnancies. Besides she had pain and tenderness in the lower left inguinal region. In January menstruation, as she supposed, reappeared, at least there was considerable bleeding, and irregular contractions, which suggested a miscarriage.

Dr. N. P. Wood of Independence was called on account of the hemorrhage. On vaginal examination he found a small membrane loose in the vagina; he did a curetment and supposed the trouble was at an end, but the symptoms of pregnancy continued. I saw the patient with Dr. Wood, on two different occasions. On vaginal examination we found a mass in the left side; this mass was rather freely movable, exceedingly sensitive to pressure and the patient complained very much of pain that was increasing daily.

The patient, Dr. Wood and myself, all diagnosed pregnancy regardless of the miscarriage. On account of the pain, we decided to open the abdomen, and found pregnancy in a rudimentary horn.

The treatment consisted in the removal of the impregnated horn, together with the tube and ovary on that side. The abdomen was closed without drainage. The patient recovered and left the hospital on the twelfth day.

Malformations of the uterus form an interesting group of genital anomalies. Being formed by a fusion of the Mullerian ducts, the uterus is subject to a variety of anomalies according to the degree of fusion of the ducts which takes place. Conditions which are said to prevent complete fusion are distention of the allantois, nonclosure of the abdominal wall and the existence of

\*Read before the Jackson County (Mo.) Medical Society.

adhesions between the rectum and bladder. Uterus bicornis is that degree in which the two halves or horns are entirely separate, but are more or less intimately united in the region of the cervix. This type of uterus is the mean between the uterus didelphys in which there is no union, and the uterus septus in which there is no external evidence of nonunion, but in which there is a septum dividing the uterine cavity more or less completely.

One horn of a bicornate uterus may be rudimentary, giving rise to the uterus unicornis. The separation of the horns may be indicated by only a slight depression at the fundus, producing the so-called uterus cordiformis.

Uterus bicornis has little clinical importance aside from the reproductive functions. Irregular menstruation may occur every two, four or eight weeks. In the first instance the discharge comes from each horn once a month, but there is no coincidence of dates. In the second instance the discharge comes from both horns at the same time or from one horn one month and from the other the next. In the last instance there is a bimonthly discharge from one horn while on the other side there is an imperforated condition of horn, vagina or hymen, which prevents the appearance of a discharge.

This condition of the uterus sometimes explains the continuance of menstruation during pregnancy, also superfetation.

Abortion, or labor at full term may occur; malpresentations, low implantation of placenta and hemorrhage are common.

Diagnosis is seldom made until pregnancy and labor have taken place, sometimes not then. Menstruation every two weeks, or menstruation persisting during uterine pregnancy should suggest the possibility of this anomaly. In the presence of double cervix or vagina the skillful use of the sound should lead to a diagnosis.

(Discussion by Dr. Mosher.) A double uterus is a rare anomaly. It is difficult of diagnosis, and the mortality following pregnancy is still lamentable.

My own experience in this malformation is limited to two cases, one of them uterus unicollis bicornis, the other uterus duplex separatus cum vagina separata.

The first case was that of an unfortunate young woman, who in 1893 came from Ohio to Kansas City to a professional female abortionist, who, after several unsuccessful attempts to use a sound on the girl, finally punctured through the vaginal vault into the peritoneal cavity, and afterward succeeded in passing it

into the impregnated horn, causing abortion. The case came into my care and that of Dr. J. P. Jackson, uncle of Dr. Jabez Jackson, on account of the infection resulting in septic peritonitis from which the patient finally died. The coroner's inquest revealed the two distinct corporæ uteri, one of them being lined by smooth decidual membrane slightly hypertrophied, the other showing signs of the recent abortion. Dr. Griffith, who was at the postmortem, was the only person present who had previously seen the anomaly, his case having been in his student days at Bellevue Hospital.

My second case was that of a young married woman in whom I encountered a septum in the vagina, in making a digital examination at the beginning of labor. Her labor was uneventful, and subsequently the two complete canals, each with vagina, cervix, and uterine body were made out. She was afterward delivered of a second child without unusual event.

When pregnancy takes place in one horn of a two horned uterus, or one side of a double uterus, the result is frequently disastrous. If the horn is well developed, the delivery may be normal. If rudimentary, and with no normal communication with the lower genital tract, the condition is very like ectopic gestation. Symptoms, course, and treatment are practically as in an ectopic case.

Kehrer in an analysis of eighty-one cases recommends intervention by Cesarean section after the thirty-second week—his cases being about equally divided between unicornis bicollis and bicornis unicollis.

In unicornate uterus there is nearly always malpresentation and malposition owing to inclination of long axis of the cornua to the pelvic canal. There is the same tendency in one horn of a bicornate uterus. In pregnancy in one-half of the septate uterus, the unimpregnated half may act as an obstruction. In these cases labor pains are weak and inefficient. Version should be avoided if possible, because of its danger of rupturing the uterus.

Mauriceau, the contemporary of the Chamberlens of forceps fame, gave the first description of pregnancy in a rudimentary horn. The greatest collection from the literature includes eighty-four cases by Kehrer in 1900, of which in seventy-nine per cent. there was no proximal end communication of the rudimentary horn with the uterine cavity. Pregnancy must have followed external migration of the ovum. Normal decidua and placental tissue are essential in the rudimentary horn, and in the non-

pregnant horn there is formation of decidua as well as hypertrophy. Unless there is free communication between the two horns, which is rare, normal delivery is impossible. Spontaneous rupture may occur in the fourth month and the patient die of intraperitoneal hemorrhage. Sanger's report in 1884 showed a mortality of 87 per cent., Kehrer's in 1909, 47 per cent., the improvement in results being due to greater accuracy in diagnosis, the development of asepsis, and more frequent interference. If muscular tissues are abundant and pregnancy goes on to term, the fetus may be eliminated by suppuration, or be converted into a lithopedion.

In the later months false labor and finding an empty uterus is usually the first indication. If the child dies, the uterus is found empty, and a sac beside it is found to hold the child. This sac represents either a pregnant tube or rudimentary horn which is diagnosed by the location of the round ligament or by a sulcus between the mass and the uterus. When the two horns are well developed pregnancy may occur in either horn. If a twin pregnancy, an ovum may be in either horn, or both in one. In case of the former the delivery may be at different occasions. If pregnancy is in one horn, the hypertrophy of the other may fill the pelvic canal and obstruct labor, causing ruptured uterus. In uterus bicornis, pregnancy usually ends in spontaneous labor at term. My one case had two children; one of Williams had given birth to eight before any anomaly was discovered.

Usually double vagina or double cervix points to double or at least bicornate uterus. If only a single cervix, as in uterus bicornis unicollis, the condition escapes observation, unless the patient is early examined, and the depression at the fundus between the two halves calls attention to the true state of affairs. The treatment of pregnancy in a rudimentary horn is always abdominal section, and removal of the pregnant cornu. Such gestation is accompanied with much discomfort and actual pain, and is apt to be terminated by internal rupture if there is no opening of the proximal end.

Sanger first operated on the pregnant horn in 1884; the reported cases operated on up to 1910, are forty-four with a mortality of 13 per cent., according to Kehrer and Wells.

Diagnosis of pregnancy in double uterus is seldom made, as in a majority of cases spontaneous labor occurs at term. Halbau gives a pathognomonic sign of uterus bicornis pregnancy by



palpation of the vesicorectal ligament, finding it as a band extending up from the bladder over the top of the uterus, and lying between the two round ligaments.

Acknowledgments of statistical bibliography is made to Edgar, Hirst, Williams and Dorland.

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## TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

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*Meeting of April 9, 1912.*

*The President WM. E. STUDDIFORD, M. D., in the Chair.*

DR. GEO. W. KOSMAK reported a

### CASE OF PUBIOTOMY.

The case herewith presented is reported for the purpose of calling attention to the x-ray findings about three weeks after delivery. Although the immediate results of the operation were favorable as regards the mother and child, the ultimate improvement in the size of the pelvic inlet was evidently not obtained, a claim often advanced for the operation.

Mrs. Gutta S., age thirty-nine, born in Russia, ii-para. The previous labor in December, 1910, necessitated forceps extraction, with living child. The patient menstruated last during June, 1911, and her pregnancy to date was perfectly normal. The patient went into labor at 8 o'clock on the evening of February 29, 1912, and stated that her membranes ruptured about this time. She was admitted to the N. Y. Lying-In Hospital on March 2, after having had continuous labor pains during the interim. Examination made at the time of admission showed a patient of rather short stature with a moderate degree of lordosis present. She was rather poorly nourished, with flabby muscles and a general anemic appearance. The pelvic measurements were as follows: between spines 24 cm., between crests 27 cm., external conjugate 18.5 cm., right oblique 21 cm., left oblique 22.5 cm., diagonal conjugate 10 cm. (scant), true conjugate estimated to be about 8 cm. The sacral promontory was very marked and the internal measurement was readily made. The pubic arch was narrow and all the diameters at the outlet contracted. Vaginal examination also showed that the external os was almost occluded and the small pin-point opening was found with difficulty. After the finger was pushed through the latter, a dilatation of three fingers was easily secured. The membranes were found to be ruptured and although the pains were fairly strong, no advance had resulted. The fetus was in the L. O. A. position with the head free above the brim. The uterus was firmly

contracted around the child and the liquor amnii almost all drained away. The fetal heart sounds were strong and varied from 120 to 140. Palpation of the head showed that this was only of medium size but very hard and the failure of engagement had naturally prevented any tendency to molding.

We were dealing in this case with a woman in labor for forty-eight hours, who had been examined before admission to the Hospital, whose labor pains were strong but ineffective in producing any advance of the presenting part; a flat obliquely contracted pelvis with diminished outlet, a living child and membranes long ruptured. If the patient had been seen earlier, a version might have been considered but was contraindicated by the more or less tonic contraction of the uterus and the complete drainage of the liquor amnii. Abdominal Cesarean section was contraindicated on account of the long labor with early rupture of the membranes and the frequent vaginal examinations. As the child seemed in good condition, a pubiotomy seemed to offer the best chances to the mother and was accordingly done.

*Operation.*—The bowels were thoroughly emptied with a soap-suds enema and the bladder catheterized. The field of operation was scrubbed up with soap and water, followed by irrigation with bichloride. The buttocks were drawn to the edge of the table and the legs held in a semi-flexed position by assistants on either side. An incision about an inch long was made over the left tuberculum pubis and the dissection carried down to the bone with the knife. The finger was then inserted and pushed downward back of the pubis around the lower ramus. The bladder did not come into contact with the finger. A long curved clamp was then shoved downward through the incision and the tip brought out in the upper portion of the left labium, a small incision in the skin allowing of its delivery, at this point. The loop of a Gigli saw was then seized and brought up through the canal. The axis-traction forceps had been left in place during these maneuvers and as soon as the bone was cut through the head was readily brought down through the brim with a few traction efforts. As it was believed that the oblique application of the forceps blades was unsatisfactory, these were removed after the head was in midpelvis and the solid blades applied with which the extraction was easily completed. The cord was tightly drawn around the neck in two loops and interfered somewhat with the descent of the trunk of the child. The marked contraction ring which was present and interfered with the application of the forceps blades seemed to give way as soon as the traction efforts were made. The child was considerably asphyxiated, more from the compression of the cord probably than from anything else as the fetal heart was perfectly good before expression. It was resuscitated however, with hot and cold baths and artificial respiration and was uninjured, except for an abrasion over the right molar bone, due to the forceps.

Examination of the vagina showed an absence of all lacerations and the cut ends of the bones gaped about an inch. There was a moderate amount of bleeding from the lower wound but this was controlled by pressure during the delivery and there was no evidences of any hematoma present when the delivery was completed. A narrow strip of iodoform gauze was packed lightly into the upper opening and a silkworm-gut suture introduced. After expressing the placenta a tight bandage was drawn around the pelvis and pressure also made over the vulva with the aid of a T-binder. The patient was returned to bed in good condition, the operation having taken about fifteen minutes from the time the incision was made until the child was extracted.

*Postoperative Notes.*—The patient made a good recovery from her anesthetic and did not have very much pelvic pain. During the first twenty-four hours she was catheterized at intervals of twelve hours and from 15 to 16 ounces of urine withdrawn each time. There was considerable distension with gas present which was relieved, however, by inserting the rectal tube and leaving it in place for an hour. The woman was put on a diet of strained gruels, broths, eggs, but was not given any milk. It was found necessary to catheterize the patient as the retention of urine was absolute. This was done as carefully as possible every twelve hours by the house surgeon. Examination of the urine on the date following operation showed a trace of albumin with some pus cells and a small amount of mucus. Subsequent examinations showed a continuance of the albumin with slight excess of indican and an increasing amount of pus, so that by the end of the first week after operation, a definite cystitis could be admitted. The reaction of the urine, however, remained acid, except in one specimen, and it was considered that the urinary retention had probably provoked a trigonitis, rather than a general inflammation of the bladder. The urinary excretion was rather scanty but all the bladder symptoms cleared up very rapidly with the administration of a diuretic and urotropin. After the end of the first week the patient voided without much difficulty.

The gauze was removed from the upper wound at the end of twenty-four hours and the latter healed without difficulty. The patient was kept in bed for the greater part of three weeks but had no other symptoms referable to the operative site. Her bowels, however, gave a great deal of trouble as there was more or less intestinal atony with distention and flatulence during all this time. The patient's general condition was only fair but she could nurse her baby during this period quite readily. The lochial discharges were normal during all this time.

The patient complained at various times of indefinite muscular pains in the shoulders and arms which seemed to subside however, with the administration of salicylates and phenacetine. On the twenty-third day after operation, the temperature again went up



and the patient complained of severe pains in the lower part of the chest posteriorly which subsided however, a few days after the administration of a few doses of aspirin. As nothing could be found in the chest, it was believed that this condition was probably neuralgic in character. The patient was discharged on the thirty-third day, able to walk with only slight difficulty, without complaint of pain or disability. The baby weighed about 2900 grams at the time of discharge and was in good condition, not having quite regained its birth weight but otherwise normal.

An x-ray picture taken on the twenty-eighth day after delivery, showed that the separation between the cut ends of the pubic bone after the operation had diminished considerably, so that the interval was less than  $1/4$  inch. There was no evidence of callous formation present and the symphyseal separation was wider than the operative wound in the bone. The pelvic measurements at the time of discharge were practically the same as at the time of admission.

DR. O. P. HUMPTON said that he had nine cases of pubiotomy, and x-ray examination two and nine months after operation respectively failed to show any increased dimensions of the pelvis, such as was claimed by some, followed the operation. Cesarean section was performed subsequently on two of the above cases and the measurements taken at that time failed to show any increased dimensions. X-ray examination both early and late revealed the fact that there was not a bony union but a fibrous union with an early disappearance of the callus.

DR. WM. E. STUDDIFORD asked if the patient was strapped.

DR. KOSMAK replied that she was but only for the purpose of keeping on the dressings.

DR. HIRAM N. VINEBERG reported a case of

#### POSTABORTIVE SEPTIC FIBROID TUMOR OF THE UTERUS. HYSTERECTOMY, RECOVERY.

Mrs. R. K., age twenty-three years, married two years. Onset on menses, fourteenth year, regular, average duration and amount. Became pregnant for the first time three and a half months ago. Dr. Vineberg was called into consultation November 11, 1911. The prior history was as follows: About two weeks before began to suffer with pain in the lower part of the abdomen, and consulted her family physician, who found the uterus to be of a size corresponding to the gravid organ, between the sixth and seventh month. From the size and hardness of the uterus, he readily made the diagnosis of pregnancy complicated by a fibroid tumor. The patient was sent to a private sanatorium. On the evening of November 1, she miscarried of a fetus of about three and a half months, the placenta being retained. Immediately following this, without any marked loss of blood, the patient went into apparent collapse, the pulse was thready and rapid, and the countenance was very pale. After vigorous hypodermic stimu-



lation the patient rallied in about three hours. The uterus was packed with iodoform gauze to prevent hemorrhage. Fourteen hours after the expulsion of the fetus, a well-known gynecologist, removed the placenta under narcosis. There was no recurrence of symptoms of collapse following this intervention. Two days later (November 3), chilly sensations and fever (102-103) set in. From this time until the date of my visit (seven days), the temperature ranged from 102°-105°, and pulse 100-120. On the morning of November 11, temperature reached 106.4, pulse 130. At the time of my visit the patient looked very deeply septic. She was somewhat apathetic, tongue heavily coated, pulse 150, temperature 105, respiration 60. On bimanual examination the uterus was found to reach to the umbilicus, the cervix open and the finger detected a soft mushy mass in the uterus, giving off a very fetid odor. The diagnosis was easily reached of a submucous fibroid growth, which had become infected. In view of the incident (symptom of apparent collapse) following the abortion, it was deemed by the family physician and the two gynecologists, who had seen the patient in consultation from time to time, that any surgical intervention would be too dangerous and would in all probability be attended with death on the operating table, although it was freely admitted by all three that the patient had no chance to recover without operation. I did not concur with the opinion as to the hopelessness and as to the certain fatality of surgical intervention, and, was willing to assume the responsibility of performing a hysterectomy. The patient was transformed to Mt. Sinai Hospital and at 9 o'clock the same evening, a panhysterectomy was performed by me. In order to prevent soiling of the peritoneum and abdominal wound, the uterine cavity was first irrigated with bichloride solution and packed with iodoform gauze, the cervical os was then sutured tight. The operation offered no technical difficulties, the right spermatic vein was dilated and tortuous and was ligated higher up than usual. The entire operation including suturing of the edges of the vaginal wound, suturing together the layers of the broad ligament, and the closure of the abdominal wound by three tier sutures, took about forty minutes. The patient withstood the operation remarkably well, pulse prior to operation 160, at the end of operation 120 and of good volume. It was truly striking to note the difference in the patient's appearance next morning. She had a placid smiling countenance, mind perfectly clear, pulse 110, temperature 101. Convalescence was complicated with a breaking down of the abdominal wound and a phlebitis of the veins of the left leg.

The excised uterus corresponded in size to the gravid organ at about the fourth month and presented a submucous fibroid, almost black in color and of a very soft consistency. There was no placental residue and the cavity of the uterus not encroached upon by the tumor was perfectly smooth.

Apart from the recovery of the patient after so serious an

infection, the case offers some other points of interest, (1) the youthful age of the patient with so large a fibroid growth; (2) the absence of hemorrhage, although the growth was principally submucous; (3) the occurrence of pregnancy in the presence of a fibroid growth in that location.

The case, further emphasized, in a striking manner, the observation the reporter has frequently made, that deeply septicized patients with a temperature of 106 and over and a pulse from 130 to 160 will withstand a hysterectomy, providing it be expeditiously done and without, an undue loss of blood, apparently with less shock, than the nonseptic woman.

Touching the question of pregnancy complicated with fibroid growths of the uterus, it may be of interest to refer to two cases recently operated upon by Dr. F. Krug, at Mt. Sinai Hospital. In the one case the patient was thirty-four years of age, a primipara, who eleven days before admission into the hospital, was delivered of a premature still-born fetus, at about seven and a half months. The uterus reached to above the umbilicus. There was moderate fever (100-102), pulse 80-90, and general condition good. Operation disclosed a submucous fibroid, size of a coconut, undergoing sloughing. The patient made an uneventful recovery.

In the other case, the patient, a nullipara, was twenty-eight years of age, married eight months, and was admitted into the hospital for an incomplete abortion, at about the seventh week of pregnancy. It was discovered that she had a fibroid growth, the size of a fetal head. She was first curetted and some days later, hysterectomy was performed. The growth was also of the submucous variety. The patient made a very satisfactory recovery.

In both of these patients, there had been no prior menstrual disturbances.

DR. GEORGE GRAY WARD, JR., reported a case of

#### FIBROMA UTERUS COMPLICATING PREGNANCY; MYOMECTOMY.

He said that Mrs. S. was referred to him by Dr. Ludwig Kast on February 13, 1912. She was forty-four years old and had been married two years. She had never been pregnant. Her menstruation had always been irregular, twenty-one to twenty-four days interval and of from five to six days duration, and scant in amount. Her weight was about 170 pounds and she was short and heavily built and well nourished.

Her history was that her menstruation had ceased on September 30, 1911, four and a half months previously, and she had noticed that the irregular enlargement of her abdomen that she had observed for some years seemed to be increasing. She had considerable pain in the lower abdomen and slight nausea at times. She had been told by a physician that she had a tumor.

The examination revealed a growth in the abdomen, which

reached 2 or 3 inches above the umbilicus, which was nodular on the left side, apparently occupying the iliac fossa, and on the right side which extended highest the mass was distinctly cystic in character. The breasts gave no signs of value. The vagina was bluish, and the small cervix with tightly closed, external os was somewhat softened. Vaginal examination revealed a large growth apparently completely occupying the cavity of the true pelvis, the size and shape of a fetal head, which displaced the cervix high up and to the right. This pelvic growth seemed to be part of the growth felt above in the left iliac fossa. A diagnosis of pregnancy complicated with a large fibromyomata was made, a condition which made a labor per vaginam absolutely impossible.

The size of the growth made him feel that it was extremely likely that a myomectomy could be done and that a total ablation of the uterus with the fetus would be necessary.

Dr. Ward operated upon her at the Post-Graduate Hospital on February 16, 1912, and on opening the abdomen found that the growth was situated in the left lateral wall of the enlarged uterus in front of the broad ligament above and extended down below the brim and became there intraligamentous. The examination of the pregnant uterus showed no other evidence of growth except a small subperitoneal nodule on the top of the fundus about the size of a hazel-nut. While doubting his ability to enucleate the growth so situated without entering the uterus he, however, started to enucleate the fibroid in the usual way and eventually removed the entire growth which had a dumb-bell shape as shown. The barrier between the large cavity made and the uterine cavity was extremely thin and great care had to be observed to prevent a rupture. The cavity was closed from the bottom up with a continuous catgut suture, and it was interesting to note the marked contraction of the uterine muscle fibers which reduced the size of the hole to a very considerable degree. The uterine wound was covered over with a peritoneum suture and the abdomen closed.

The patient made a good recovery and while she had severe uterine contractions for two or three days after, she did not abort, owing to the liberal employment of morphia.

The patient left the hospital about the first week in March to go to a relative in Flatbush and the case thus passed out of his hands. The subsequent history was that on March 21, nearly three weeks after she had returned home, and thirty-four days after the operation, she went into labor and delivered herself the next day of a child a few days short of six months, which lived but a few hours.

The case was reported because of the size of the fibroid and its situation being such that it was unusual to be able to remove such a growth from a four and a half months pregnant uterus without producing an immediate abortion.



DR. AUGUSTUS A. HUSSEY reported the case of

FIBROMA UTERI AND PREGNANCY; HYSTERECTOMY.

A woman, thirty-six years of age, was admitted to his service at the Brooklyn Hospital, April 6. Her previous history was good. Her menses began at the age of fourteen, regular and of the four-day type. She had a moderate flow, no dysmenorrhea, no backache. She last menstruated July 5, 1911. She had been married eighteen months and had never had a miscarriage. Her pregnancy up to the sixth month had been normal. During the past three months she suffered with pains in her lower abdomen and back; which were worse after exercise. She had been incapacitated for one month.

The physical examination showed an anemic women, thin, with a poor color. The examination of the chest was negative. The fundus of the uterus was under the ensiform cartilage and the child's head was under the left ribs. The breech was in the right iliac fossa with the small parts of the child in front. The fetal heart was at the umbilicus, strong in character and was beating at the rate of 140.

Per vaginam the cervix was found to be high and pushed to the right. An irregular mass was felt behind the cervix and to the left. It was attached to the pelvic wall. It was not movable, not tender, and was solid. It encroached upon the inlet of the true pelvis.

In the early morning of April 7, uterine contractions began and at 7 A. M. the membranes ruptured. The cervix was dilated to the extent of three fingers and the canal was obliterated, the left foot protruding. The position of the fetus was the same as at first examination. The mass blocking the inlet was distinctly felt. Birth through the natural passages seemed impossible and a Cesarean section was decided upon. This was done at 11.45 o'clock. A living child was removed. The uterus was palpated and the tumor was felt in the lower posterior wall of the uterus and left broad ligament extending into the pelvic wall and down into the true pelvis. The uterus and tumor were removed. Both ovaries and the left tube were left. The broad ligament was opened posteriorly and the tumor was dissected from the pelvic wall. The patient stood the operation well. The temperature remained below 100° F. and her pulse has ranged from 90 to 100. Her general condition after the operation was good.

The specimen showed a puerperal uterus with a longitudinal incision in the upper anterior wall. There were several sub-peritoneal fibroids and a large lobulated, soft fibroid extending outward and downward from the left posterior wall. There was also an intramural fibroid, globular, soft, the size of a small orange which was situated in the center of the posterior wall above the internal os.



DR. JOHN VAN DOREN YOUNG reported

A CASE OF MYOMECTOMY DURING PREGNANCY, ABORTION,  
FOLLOWED BY A NORMAL PREGNANCY.

Mrs. L. M., age thirty-three years. Married one year, no children, no miscarriages. Has been in good health all her life. Menstrual history normal. First seen by me March 6, 1910. She gave a history of cessation of menstrual periods for four months, with all the accompanying symptoms of pregnancy. For three days she had been suffering with severe abdominal pains and pressure on bladder and rectum. She stated that she had had fever and some considerable depression, although she appeared in excellent condition. Examination of the abdomen showed the outline of the uterine body apparently at the fifth month of pregnancy. Vaginal examination revealed a fibroid mass completely filling the true pelvis. The uterine body with accompanying pregnancy was apparently above and in front of the fibroid, and held up by the growth. The diagnosis was fibroid of the lower segment of the uterus in the posterior wall with a pregnancy at the fourth month.

The size of the fibroid and its location precluded the possibility of normal delivery. Owing to the pressure symptoms and the pain and the immobility of the growth, I considered it a safer procedure to attempt the removal of the fibroid rather than delivery by Cesarean section. March 8, I opened the patient's abdomen and found a pregnant uterus of about the fourth month, with a fibroid situated in the lower segment of the posterior uterine wall. I was able to remove the fibroid without entering the uterine cavity.

The necessary manipulation of the uterus for the removal of the growth was limited as much as possible, but she miscarried of a four month's fetus March 9. Her recovery was normal; highest temperature 101; highest pulse rate 138, just prior to miscarriage, returning to normal shortly afterward.

March 26, on account of continued uterine bleeding I curetted, removing placental shreds. She left the hospital ten days later. September, 1910, she became pregnant, period of gestation was normal and on July 9, 1911, I delivered her of a male child, at term, with medium forceps. Her puerperium was uneventful, and examination six months later revealed uterus and adnexa normal.

Dr. Herman J. Boldt said with regard to myomata causing abortion, while he, too, thought so formerly, he now doubted it. He had seen a large number of myomatous tumors during pregnancy and it was seldom that abortion resulted from this complication. Dr. Boldt said he was particularly interested in hearing the history of the patient operated upon by Dr. Ward. He removed a myomatous tumor some years prior for the purpose of preventing abortion. The operation at that time was undertaken solely for that purpose; abortion pains had already been present several hours, and the plan of treatment followed

was the same as the one followed by Dr. Ward. Morphine was given after the operation. The patient went to term and she was now in good condition. The child lived for some time.

With regard to Dr. Vineberg's patient, he showed good judgment in operating upon her. Dr. Boldt believed, as he did, in dealing with myomatous tumors that were in a septic condition, that they were justified in doing operation upon them, particularly when such careful attention to the preparation of the patient was carried out as in the case reported.

Dr. McNaughton's paper interested Dr. Boldt. He believed it was Thorn of Germany, who called attention to the relationship between antelexion and the development of myomatous growths. Up to that time no attention had been paid by him to the relationship between antelexion and myomata, and the resulting changes in the circulation. Since then he had given this matter some thought; in the observation of his patients and, in most of them at least, so far as his observation went, he considered it merely a coincidence and that there was no real causal factor present. Dr. McNaughton considered this relationship as did Thorn, that there was a direct causal factor of myomata in the malposition of the uterus. Thorn claimed that the development of the tumor was caused by the disturbance in the circulation which was caused by the antelexion.

Dr. Boldt said he was particularly interested in Dr. Watt's paper and he recalled one instance of subserous myomata with a pedicle twisted one and a half times; peritoneal symptoms appeared necessitating operation. The patient went to term. He could recall but two instances in his experience where an operation was done for such condition and followed by an abortion. He could see no reason whatever why a woman should abort when the myoma was a peritoneal, if great care was exercised and if the uterus was not handled any more than was absolutely necessary in removing the tumor. That was the secret of success in these operations; in former years the operator handled the uterus too much and patients failed to go to term. If the uterus was not manipulated too much they would likely go to term.

DR. JOHN O. POLAK said there were three points he would like to speak about.

First, regarding the tolerance of the pregnant uterus to operative procedures for complicating fibroids. Among the cases that he had seen and operated upon he could not recall a single instance where abortion followed as the result of operation, the removal of a myomatous growth complicating pregnancy. The point just brought out by Dr. Boldt was one he had recognized the importance of, *i.e.*, avoid manipulation of the uterus as much as possible in removing the tumor. In several cases the tumors were so deeply interstitial that in enucleating the tumor, the uterine cavity was entered; these injuries had to be repaired as we close a Cesarean section wound.

Under the use of morphine following the operation, the patient had gone to term. In no case was there any tendency to rupture shown.

Second, a point which Dr. Watt brought out, *i.e.*, that fibroids complicating pregnancy, were a contraindication to the induction of abortion because of the complications that may be produced. The only patient with a fibroid complicating pregnancy who had died as the result of her pregnancy, was one on whom abortion was performed. She promptly became septic. Sepsis in myomatous uteri was a serious proposition to deal with owing to the tortuous canal.

Third, in reference to Dr. McNaughton's paper, and what was said regarding the relationship of antelexion with dysmenorrhea and myomata. Dr. Polak said he had followed the cases and could endorse what he had stated. Women with antelexed uteri drain badly, and will suffer from dysmenorrhea unless they were treated early in their menstrual life, and if they do not become pregnant almost invariably develop fibroids. When these women are properly drained by a Reynold in conjunction with the Dudley operation—the chances for the development of fibroids will be minimized.

The papers of the evening were read by DR. GEORGE McNAUGHTON on

#### THE STUDY OF UTERINE FIBROIDS.\*

And DR. JAMES WATT on

#### FIBROMATA UTERI ASSOCIATED WITH PREGNANCY.\*

#### DISCUSSION.

DR. AUSTIN FLINT, JR., said that he had but little to add to the discussion but was very much interested in the many points that were brought out and especially in the subject of fibroids complicating pregnancy, or pregnancy complicating fibroids. All had more or less important ideas regarding this which were based on personal experience. At times fibroids complicating pregnancy did not mean anything serious, but sometimes such a complication was serious and might require a great deal of interference such as enucleation or myomectomy.

With regard to the early diagnosis of fibroids, this was very important. Occasionally he had removed what was supposed to be a simple uncomplicated fibroid; upon opening the specimen it would be found that the woman was pregnant even though she had been bleeding for a considerable length of time. Dr. Flint recalled one case of fibroid complicated by pregnancy, where the woman bled for three months. Sudden or rapid growth of a fibroid without other symptoms should make one suspicious of intercurrent pregnancy, and any operation con-

\*To be published later.



templated should be postponed until an exact diagnosis was possible in order that the woman might go to term and be delivered of a living child.

Another point, was that when Cesarean section was performed for fibroid complicating pregnancy, it should be followed up by a hysterectomy. From a study of statistics, the results were better than when the uterus was left. When he was connected with the staff of the Lying-In Hospital, a patient had a fibroid in the posterior part of the cervix and an ordinary Cesarean section was performed, trusting that the fibroid would diminish in size and that swelling was due to pressure. This patient died of sepsis.

Dr. Flint said that he had looked up the results of Cesarean section followed by hysterectomy and contrasted them with the results of Cesarean section leaving the fibroids in place, and the former gave better results than did the latter. He believed personally that the increase in size of fibroid growths in pregnant women was not so much from the edematous swelling as it was from the increased nutrition and increase in the blood supply.

DR. HOWARD C. TAYLOR said that he had performed myomectomy on pregnant women on three occasions. In all the cases the fibroids were of the interstitial variety, the smallest the size of an orange, the largest the size of a grape fruit, and the pregnancies were from three to six months. In no case did the fibroid extend to the cavity of the uterus and in no one case did an abortion occur during the time that the patient remained in the hospital.

He also said that he was very much interested in the case reported by Dr. Vineberg. All would agree under ordinary circumstances a hysterectomy was indicated in a case of extensive fibroid of the uterus. He doubted, however, that it would be often justifiable in a patient with a pulse of 160 at the beginning of the operation. It is rather unusual to have the pulse so much lower after a hysterectomy than it was before and it is difficult to explain this entirely by the removal of the septic fibroid. It is possible that the rapid pulse was due in part to the trip to the hospital, the recent consultation and the anxiety about the operation, and not entirely to the condition in the uterus. He thought the case an interesting one and he would keep it in mind in his future work.

Dr. Taylor was very much interested in Dr. McNaughton's paper showing the relationship between fibroids of the uterus and interference with the blood supply, he had not noticed it himself but he would keep it in mind in future observations. He had noticed that women who had severe dysmenorrhea, later in life also had fibroids in the uterus. He had supposed that the fibroids were the cause of the dysmenorrhea at a time when they were too small to be felt. The explanation offered by Dr. McNaughton was a very interesting one.

DR. GEORGE G. WARD said that he had listened with great



interest to Dr. Watt's and Dr. McNaughton's papers and the points that the latter advanced were very interesting. There were a great many cases where subserous growths were removed without any interference with pregnancy in any way. Sometimes these masses were deeply imbedded in the uterine wall and when they were intraligamentous as well, and of considerable size, it was almost not possible to avoid considerable manipulation of the uterus, and when abortion did not occur in such cases, it was of interest. For this reason he had reported the case.

DR. H. N. VINEBERG did not understand Dr. Taylor's criticism as to what should have been done other than hysterectomy.

DR. TAYLOR replied that he had no criticism to make.

DR. VINEBERG said he had no explanation to make regarding the pulse in this case; whether the giving of the ether had something to do with the reduction in its frequency, he did not know. The anesthetist took the pulse and so reported its frequency. He referred to it merely to emphasize how well the patient withstood this surgical intervention.

It was surprising that so few men had seen miscarriages occur in cases of pregnancy complicated with fibroids for he could recall four cases that he had personally seen that miscarried. One of these women was four and a half months pregnant and with a fibroid in her cervix and bleeding had occurred for eight or ten days. She had a temperature of 101° or 102° F. The fetus, of course, was not viable but there was no doubt but that this was a beginning miscarriage. It was impossible to deliver her in the natural way so a hysterectomy was performed. She made a good recovery. The case Dr. Vineberg reported to-night was also a spontaneous abortion. Dr. Krug operated and recently removed the uterus with a fibroid as large as the one presented by Dr. Vineberg to-night in a case following a miscarriage at the fourth month. There were two other cases and one was of particular interest. The woman was in her first pregnancy and had several soft fibrous growths in the anterior wall of the uterus and the right lateral wall as well. It brought up the question as to whether to allow her to go on with her pregnancy or not. She was permitted to go on to full term when she was delivered and she made a good recovery and had been under his observation ever since. The growths seemed to diminish in size. She returned later when she was again pregnant, six or eight weeks. The uterus was studded with fibroids of various sizes. A few weeks later she was aborted and made a good recovery. One year later these growths seemed to disappear. She then became pregnant for the third time and went through her pregnancy successfully. There apparently was no return of these growths during her pregnancy or during the puerperium. She was delivered one and a half years ago and there had been as yet no recurrences.

DR. GEORGE MCNAUGHTON said that all cases of ante flexion of the uterus did not suffer from dysmenorrhea. He said he had

recently seen a case and examined her; she had been examined by Dr. Jewett two years ago. She consulted him because of irregular menstruation but she had no pain. He told her that she had an antelexion of the uterus and would probably be sterile. When Dr. McNaughton examined her he found a fibroid as large as the closed fist situated in the posterior wall of the uterus.

Another interesting point was the condition the uterus was found in during the early pregnant state; this point was brought out by Dr. Dickinson several years ago. There was an irregular development of the uterus during early pregnancy and longitudinal and transverse furrows were to be distinguished. He thought that such a finding would mean that a fibroid would result and he was quite correct.

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## TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.

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*(Continued.)*

DR. BROOKS M. ANSPACH reported a case of

PYOSALPINX WITH TWISTED PEDICLE\*

including a review of the literature:

### DISCUSSION.

DR. FRANKLIN H. MARTIN, Chicago, within the past two years had written and published an article on congenital pelvic defects, the principal one being the perpendicular pelvis and the other the loose mesentery. In this paper he dwelt particularly upon the liability to displacement of the appendages and of the uterus in these particular cases. In the perpendicular pelvis, with the symphysis above the tip of the coccyx, with the sacrum parallel with the long axis of the patient's body, with the uterus and the appendages in the center, lying in the same relative position in the pelvis, the appendages must of necessity go back. In the normal individual the pelvis was rotated to nearly right angles to the perpendicular pelvis and besides that the broad ligaments were blended well forward so that the uterus and also its appendages was drawn in that direction. In the well-developed woman the mesosalpinx was extremely short, and no torsion was possible. It was in those that were defective where we had the unblending of the mesenteries, in which the ureter stood out, as in the dog and in lower animals, that we were liable to get this condition of displacement of the appendages with subsequent torsion.

\*Paper to appear later.

The speaker would like to ask the essayist if anything in the case reported indicated that the other cases had the long mesosalpinx, or whether any notice was taken of the position of the pelvis.

DR. HENRY T. BYFORD, Chicago, thought there was one lesson that might be learned from the paper, that there were cases of pelvic peritonitis on which we should operate immediately, the same as we did in appendicitis. Given a twisted pedicle in a case of *sactosalpinx*, if peritoneal adhesions occurred there was pain, a little temperature perhaps, but no sepsis, and intestinal adhesions would occur and probably colon bacillus infection. The patient would develop a serious condition and we did not know how. If these cases were taken in hand early, when there was but little infection, or if one could make an approximately accurate diagnosis of the condition existing, he would be safe in operating as the essayist did, without expecting to find much sepsis.

In regard to the etiology, it could occur easily after a case of gonorrhoea. He had removed adherent ovaries with the evidence of past inflammation and sepsis of a decided character, in which the tube apparently had recovered when examined macroscopically. There were no adhesions and no occlusion. The tube looked quite normal to those who had operated. There were cases, rather recent sometimes, in which no adhesions could be found except around the end of the tube, and it was known that these adhesions were apt to be absorbed and the tube get free and leave a *sactosalpinx* around. It was also known that when intestinal adhesions to the tube occurred they would usually become absorbed if they were not extensive. The peristaltic action would break down the adhesions, they would very often rupture, and the tube would be free. When an adherent ovary was found which gave symptoms the ordinary practitioner was likely to make a diagnosis of pyosalpinx, but the whole trouble lay in adhesion of the ovary.

DR. JOHN A. SAMPSON, Albany, New York, was interested in Dr. Anspach's paper because he had had two similar cases. The first patient he operated in 1904 for an acute pelvic inflammatory condition and found the right tube with a twisted pedicle similar to the one described except that it was twice as large, and also an enlarged tube on the opposite side. The right tube and ovary were removed, also the left tube. The operation was done in the Johns Hopkins Hospital in the service of Dr. Kelly. He did not know the nature of the microscopic findings in the case, or whether it was tubercular. The patient's age was nineteen.

The second case he operated a year and a half ago. The patient was twenty-one years of age. She gave a history of a sudden attack of severe abdominal pain, associated with nausea and vomiting. She had a soft uterine tumor and a diagnosis was made of ovarian cyst with twisted pedicle. At the operation



an enlarged tube was found on the right side, which was hemorrhagic, as described by the essayist, with distinct twisting of the pedicle; also an enlarged tube of the opposite side, elongated, and to all appearances a pyosalpinx. Supravaginal hysterectomy was done together with the removal of the right tube and ovary and left tube. The tube was examined microscopically and proved to be tubercular.

DR. JOHN O. POLAK, Brooklyn, New York, wanted to place on record the report of a case of twisted pedicle and tube. This occurred in a patient, nineteen years of age, apparently of the type Dr. Martin had described. The operation was done three days after the primary attack of acute abdominal pain, and one interesting point in connection with this case was the extreme size of the tube, which measured 8 by 10 cm. in its distension, and the fact that the ovary was not involved at all in the twist, the twisting being in the free and the isthmic portion of the tube, and the pelvis being free from any adhesions. This was a case which undoubtedly was primarily a hematosalpinx which had become infected. On microscopic examination, there was no evidence of tuberculosis, but colon bacilli were found in the contents of the tube.

DR. E. E. MONTGOMERY, Philadelphia, stated that some years ago a young lady, twenty-two years of age, consulted him. She was suffering from a severe attack of pain in the pelvis which came on so suddenly as to lead to the suspicion of ectopic gestation. On opening the abdomen both tubes were found filled with pus, with a twisting of the pedicle of the left tube. There was quite an extensive hemorrhage into the peritoneal cavity from the removal of the sac as the result of interference with the circulation. The environment of the patient rather led him to believe it was a case secondary to a gonorrheal infection. No microscopical examination, however, was made of the specimen.

DR. ANSPACH, in closing the discussion, and in reply to the question of Dr. Martin with regard to the predisposition to torsion by the shape or type of tube, stated that in his case there was a decided abnormality in that direction. The tube was much longer on this side, being 17 cm. in length. There would be plenty of room for a twist, and with the heavy extremity absolutely free, it could occur. The reason it did not occur on the left side was because the ovary was adherent; whereas he believed the right ovary was originally unaffected by the adhesions of the left ovary.

No one had spoken of the inclination of the pelvis, faulty habit of posture or anything connected with the mesentery except what he had ventured to say about the mesosalpinx. As Drs. Sampson, Polak and Montgomery had shown by the citation of their cases, the typical history was of an attack of pain coming on in a young woman in whom the cause of pelvic trouble was



usually not easy to explain. Possibly this was why in many cases the operation had been so long delayed. He was interested in hearing Dr. Sampson say that he had found tuberculosis in his specimen.

Involvement of the ovary seemed to be secondary, as in only six of the reported cases was it twisted with the tube. Many of these tubes had a long mesosalpinx.

THE INFLUENCE OF MYOMATA ON THE BLOOD SUPPLY OF THE UTERUS WITH SPECIAL REFERENCE TO ABNORMAL UTERINE BLEEDING, BASED ON THE STUDY OF 150 INJECTED UTERI CONTAINING THESE TUMORS.

DR. JOHN A. SAMPSON, Albany, New York, stated that in fifty-two specimens colored injection masses were used, and in ninety-eight either the arterial or venous system was injected with a material impervious to the x-ray. Stereoscopic radiographs were of great value in this work. All specimens were studied with a knowledge of the age of the patient, and, if before the menopause, the exact stage of the menstrual cycle. The arterial and venous supply of the uterus and of myomata had been described in a previous paper. The influence of these tumors on the circulation of the uterus was of much greater clinical importance than the blood-supply of the tumors themselves.

Menstruation was found to be due to a venous flow and dependent upon changes in the walls of the venous plexus of the endometrium, permitting the blood to escape. There were no valves in the uterine veins, so that the amount of blood lost was regulated in a large measure by the efficiency of the uterus to hold it back, and especially its muscular efficiency.

Large subserous myomata were very vascular and caused an hypertrophy of the uterine artery from which its nutrient vessels arose, and thus more blood was carried to the uterus and tumor; the excess over the normal was diverted to the tumor. The chief arterial and venous changes were in the peripheral zone of the uterus, and menstruation was usually not altered.

Small intramural myomata were less vascular than the myometrium, and usually did not alter menstruation but might possibly cause uterine insufficiency with its accompanying menorrhagia. Large intramural myomata were more vascular than the myometrium. They caused a dilatation of the venous plexus of the myometrium, especially about the tumor, but did not necessarily disturb menstruation. Intramural myomata which encroached upon the uterine cavity intercepted the arterial supply of the endometrium over them, and this with the pressure of the tumor caused atrophy and anemia of this portion of the endometrium. The endometrium not directly or indirectly encroached upon was always thicker and often actually hypertrophied. The menstrual flow occurred for the most part from the thickened endometrium. Disturbances in menstru-

ation might or might not occur. While the profuse flow, when it occurred, was in a measure dependent upon the increased amount of blood in the myometrium and endometrium, and the hypertrophy of portions of the latter, it was apparently due more to the failure of the uterus to control its blood, *i.e.*, to hold it back. Occasionally veins over the surface of the tumor might also become eroded and give rise to abnormal bleeding.

Submucous myomata represented a later stage of the intramural variety, and the veins over the surface of these were more apt to be affected than in the intramural variety.

Adenomyomata did not necessarily disturb menstruation, and the endometrium over them was usually atrophied.

When bleeding arose from the tumor itself due to sloughing or sarcomatous changes, the bleeding was arterial in contrast to the venous hemorrhage which occurred from the endometrium dependent upon disturbances in the circulation of the uterus and the inability of the uterus to control it.

#### DISCUSSION.

DR. WILLIAM S. STONE, New York City, said he was much interested in this class of cases. In the first place, he had now twenty-four patients whom he saw at a period when they had no visible tumor, no fibroid that he could appreciate. He had seen these patients subsequently when they had fibroid tumors and other kindred conditions.

In connection with the clinical study of these cases a few of them had been accompanied by careful histological examinations. It had led him to the suggestion which Dr. Sampson had given and had referred to, as explaining a great many cases of hemorrhage at the time of the menopause. The theory was also satisfactory and rational as applied to the causes of hemorrhage in girls at puberty. Twenty-four cases had been observed by Dr. Stone and without any histologic examinations, almost all of these cases belonged to the class of cases which might be called relatively infantile. The uterus might be of the same size *in toto*, but it retained its infantile shape, that is, the cervix and neck of the uterus were still notably larger than the body. Those changes had not occurred that ordinarily do occur in the adult uterus. With muscular insufficiency, a great many of these cases which we speak of clinically as infantile, did not have enough muscular tissue in them to keep proper control of the blood-supply which Dr. Sampson had so beautifully demonstrated to-day, and the explanation of some of the hemorrhages oftentimes seen in young girls was the same as in the cases of hemorrhage at the menopause, of which we had until recently no satisfactory explanation.

DR. SAMPSON, in closing the discussion, stated that he had also studied the effect of several tumors encroaching on the uterine cavity, the influence of disturbances in circulation caused by the submucous variety of tumors, by adenomyoma, by myoma, and

by sarcomatous changes, and also those associated with carcinoma of the body of the uterus. This would come out in the complete report.

A FURTHER REPORT ON THE RELATION OF THYROIDISM TO THE  
TOXEMIA OF PREGNANCY.

DR. GEORGE GRAY WARD, New York City, reviewed some of the work of laboratory workers and clinicians on this subject. Since his previous paper was published in 1909, the work of MacCallum and Voegtlin, Carlson and Jacobson, Beebe and others added further proofs of the importance of the thyroid and parathyroid glands to some of the physiological processes in the liver. The liver undoubtedly had an ammonia-destroying or converting power, and when this power was inhibited and the liver failed in this function, ammonia appeared in the urine and also in the blood. Thyroidectomy produced a marked depression in this ammonia-destroying power of the liver. An excess of ammonia output in the blood and urine meant a depressed functional activity of the liver or a failure in the metabolic processes. In the light of these observations it would appear logical that when there was a high ammonia output, shown in the nitrogen partition, as in a disturbed metabolism of the toxemia of pregnancy, thyroid administration was indicated.

Dr. Ward reported two additional cases which he had observed and two unpublished cases of Beebe's, which were markedly benefited by thyroid administration.

He summarized the present status of the toxemias of pregnancy of this type as follows:

1. That these cases may be classified into two groups: (a) cases having no Graves' disease, but without sufficient thyroid secretion to promote the increased metabolism in the liver made necessary by the pregnancy, and probably due to the failure of the thyroid to hypertrophy. (b) Cases associated with Graves' disease, which condition usually caused serious disturbance in the metabolism.

2. Toxemias of the first group were frequently much benefited by the administration of thyroid substance in the form of either dry extracts or a serum.

3. In toxemias of the second group, it was essential to determine whether the Graves' disease was in a condition of hyperthyroidism or hypothyroidism. If the former, rest, applications of ice, milk diet, and sedatives, should be employed, and if these measures failed, an antiserum, such as the cytotoxic serum of Beebe and Rogers should be administered. If the latter, thyroid substance should be given in the form of the dry extract, or, what was more efficient if possible to obtain, a saline extract prepared from normal human glands for hypodermic administration.

4. Reliance should be placed upon the nitrogen partition of



the urine as a guide to the severity of the toxemia rather than on the blood-pressure.

5. Induction of labor was very slow and uncertain in these cases, and where the history of former labors was that of dystocia, elective Cesarean section was probably the safest method of delivery for both mother and child.

#### THE TREATMENT OF ACUTE AND FULMINANT TOXEMIA.

DR. EDWARD P. DAVIS, Philadelphia, said that our knowledge of the complex condition known as toxemia in parturient women had reached the stage where we might distinguish between the natural history of the disease and abortive or unusual cases. In the former the patient accumulated toxins in her blood until the nerve centers became so irritated that convulsions, eclamptic in character, developed. The mechanism of these convulsions was such as to produce excessive muscular contraction, in the majority of cases extending to the uterus and causing expulsion of its contents. This was followed by a gradual diminution in blood-pressure, by the reestablishment of the circulation in the kidneys and abdominal viscera, and in a considerable number of cases by the gradual recovery of the mother. In other cases labor failed; the convulsions brought about relaxation of arteries, the secretion and excretion were reestablished; the patient might recover and subsequently give birth to a living and viable child.

Such in the light of our present knowledge was the natural history of the toxemia of pregnancy, culminating in the conservative process known as eclampsia.

Of late much attention had been drawn to fulminant toxemia, styled by some eclampsia without convulsions. The extensive literature of the subject furnished abundant evidence that the liver was primarily at fault in these cases, that the ductless glands shared in the loss of perversion of function, and that the involvement of the kidneys was secondary. When toxemia became overwhelming the patient's nervous system was overcome by the poisons and the stage of convulsions was not reached. There was intense cerebral disturbance, profound involvement of the sympathetic nervous system, shown by deadly nausea or violent vomiting; pulse tension abnormally high or excessively low; with failure of secretion and excretion. Where the liver was most dangerously involved hemorrhage was the most significant and alarming symptom. This might be from any glandular organ of the body; from the kidneys as shown in bloody urine, from the mucous membrane of the stomach, illustrated by vomiting of blood, from the bowel as demonstrated by bloody stools, and from epithelial surfaces illustrated by petechial eruption and multiple hemorrhage into the epithelial organs. So intense was the poison that the fetus rarely, if ever, survived, the placenta sharing as a secretory organ



with the hepatic derangement present, and the fetus perishing from overwhelming toxemia.

In attempting to interpret correctly the gravity of the condition present in a given case, one was at once dismayed by the fact that upon no one symptom could one lay predominant weight. The effort to establish a given rate of pulse tension was dangerous and had not been successful, in view of the observations of Bailey and others, who had found great variation in blood-pressure in these cases. The examination of the urine failed to give a true picture of the gravity of the situation, as the urine might be comparatively normal to average methods of examination, containing toxins which it was exceedingly difficult to isolate. The temperature of the patient might vary considerably.

One was forced to the conclusion, borne out by experience, that each case of toxemia of pregnancy must be studied by a thorough physical examination, and that undue importance could not be assigned to any one symptom.

One fact stood out preeminently in all fatal cases of toxemia of pregnancy, and that was the disorganized state of the blood, the minute hemorrhages in the liver and other organs, and in those patients in whom fulminant toxemia lasted for some time, the occurrence of pulmonary edema and of gangrenous pneumonia. Whatever we could do in the way of treatment must be addressed to avoiding these conditions.

In view of these negative statements, what did the present state of our knowledge offer as a more hopeful view? There could be no doubt of the value of prophylaxis. Each pregnant woman must receive skilled attention during her entire pregnancy. By this and by this only could fulminant toxemia be avoided. No problem in medicine was more difficult, but none more important in the saving of life.

The value of milk as a prophylactic diet must be insisted upon, and the advances made in the modern production of milk and the fact that good milk was now available almost universally, should aid greatly in this important method of treatment. The prevalent taste for fresh air should also be encouraged. A thorough physical examination should give warning of the approach of fulminant toxemia. Great variations in pulse tension, disturbance of the nervous system, inability to retain nourishment, disordered secretion and excretion, and variation in the nitrogenous output of the body, as demonstrated by the nitrogen partition in the urine, were all of paramount importance.

In the presence of fulminant toxemia, it was the belief of the writer that conservatism was the wisest course. This belief followed his trial of all forms of treatment which had so far been suggested by competent observers. He felt confident that his mistakes had been in the too radical employment of methods which in themselves seemed logical and wise.

To bring this matter to a concrete statement, the patient

should at once, if possible, be transferred to a hospital. She should be placed in bed, between blankets, the skin thoroughly but gently cleansed, and gentle but continuous perspiration encouraged by a heat in the form of hot water bottles placed about the blankets. If the case was not threatening, the electric cabinet might be found most useful. Wet heat was less desirable than dry, as it was less stimulating, more depressing, and could not be continued for so long a time. However, if dry heat be applied, it should never be carried to the point of depression, but should be used as continuously as possible.

The stomach and bowels should be as promptly and thoroughly emptied as possible, by irrigation with warm salt solution. The conclusion of gastric lavage might be marked by a moderate dose of calomel and soda left within the stomach. Following the copious irrigation of the bowel, salt solution might be continuously administered by the Murphy method during periods of from four to six hours. The bladder should be emptied by catheter. The anesthetic effects of oxygen should be obtained if possible. If it could not be given by apparatus, the patient's room should be aired as thoroughly as possible. To sustain the circulation, moderate doses of digitalis combined with a cerebral sedative had proved of value.

Dr. Davis's experience had been that one should wait for nature to declare herself before interfering. It was a point of great importance that the obstetrician should ascertain as promptly as possible whether the mechanical conditions were such that the disease might take its natural course, terminating in muscular contractions and the expulsion of the uterine contents. If the woman had a highly contracted pelvis or pregnancy was complicated by a tumor, or if great disproportion was present, it was useless to wait for spontaneous delivery. The natural course of the disease could not be expected to develop. If, on the other hand, the conditions were favorable for the expulsion of the fetus, in his experience no interference should be practised until the uterus showed signs of discharging its contents. When the cervix was softened, and the presenting part engaged, the rupture of the membranes often served a useful purpose. Labor and spontaneous expulsion usually followed, and if the patient's circulation be sustained during this period and she be given moderate doses of sedatives at regular intervals, the results in his experience had been the best which he had seen. If labor is prolonged after beginning spontaneously, it should be terminated in a manner requiring the least anesthesia and with the least violence to the mother. Should anesthesia be undertaken, the smallest quantity of ether, with the greatest amount of oxygen should be selected. Moderate bleeding should be encouraged after the delivery. Prolonged anesthesia was to be carefully avoided.

On the other hand, should the conditions be unfavorable for spontaneous delivery, and the uterus make an effort to expel its

contents, he believed that rapid delivery by abdominal section was the operation of choice. He preferred this to vaginal section because it was free from mechanical difficulty, and did not open the veins above the pelvis and lower portion of the birth canal. Isolated cases furnished examples of prolonged success by various surgical procedures applied to these cases. Thus prolonged anuria has yielded to decapsulation. The balance of toxemia had been successfully thrown in favor of the patient by the amputation of the breasts. Vaginal Cesarean section had its distinguished and able advocates. If statistics might be relied upon, one could not neglect Stroganoff's maternal mortality of between 6 and 7 per cent. under conservative treatment. It was the statement of his house staff at St. Petersburg that with him conservatism was carried to the furthest extent, and that they rarely witnessed a surgical procedure in the treatment of fulminant toxemia.

The most recent collection of statistics in the operative treatment of this condition was made by Peterson whose mortality rate was considerably higher than that of Stroganoff.

#### THE TREATMENT OF ECLAMPSIA.

DR. FRANKLIN S. NEWELL, Boston, stated that since the etiology of eclampsia was unknown the treatment must be symptomatic and empirical. Until the physiological chemist finds the causative agent, treatment must be directed toward (1) limiting the amount of the toxin which was absorbed; (2) the prevention of damage by the toxin already absorbed; (3) elimination of the toxin; (4) treatment of the patient.

1. Limitation of absorption of toxins was only to be accomplished by ending the pregnancy. The method of dilatation of the cervix and operative delivery must be chosen to suit the needs of the individual patient and operative skill of the obstetrician. Slow methods of dilatation were not to be advised.

2. Prevention of damage by toxins already absorbed. Control of convulsions by the free use of morphia to the point of slowing respiration to twelve per minute. Lowering of blood-pressure to approximately normal point by venesection in order to reduce the strain on the heart.

3. Elimination of toxins. Free catharsis induced by the use of croton oil and salines in repeated doses until several watery movements have resulted. Washing out of the lower bowel by flushing. Probably most of the toxin was excreted by the intestinal tract, and if not removed might be reabsorbed and cause a recurrence of symptoms.

4. The patient must be treated in certain cases and the disease allowed to care for itself, since it was evident in some cases that any active interference would cause the death of the patient, and the only hope lay in palliative measures. In these



and in patients who had reacted badly to operative procedures, direct transfusion of blood should be considered as a possible life-saving procedure.

(To be concluded.)

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## CORRESPONDENCE.

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### SUTURE OF THE SPHINCTER ANI IN OPERATION FOR COMPLETE LACERATION OF THE PERINEUM.

TO THE EDITOR OF THE AMERICAN JOURNAL OF OBSTETRICS.

Dear Sir:

In the June number of your JOURNAL, I am reported as laying claim in a discussion to being one of the first if not the first, to describe the separate suture of the sphincter ani in operating for complete laceration of the perineum. My case is referred to in the *Medical News* for Sept. 22, 1894. (Case 6.) Priority in such a matter is at best a minor thing, but I gladly refer to the following, since discovered, which completely antedates the usual references of writers, and is the earliest description which I have seen of a buried suture including nothing less than the muscle ends, and that is the pith of the whole method

Dr. Albert H. Smith of Philadelphia (Trans. Am. Gyn. Soc 1883, p. 90) writing on the "Use of Hot Water in controlling severe Hemorrhage" incidentally describes his sphincter operation as follows:

"With some trouble I found the extremities of the torn sphincter and laid them bare to a sufficient extent as to bring together good surfaces of muscular fiber, which I fastened together with a special stitch, simply penetrating the substance of the muscle. The other stitches I inserted as usual, beginning with the deep encircling perineal stitch of Dr. Emmett."

Doubtless the reason why the buried separate stitch was not earlier developed, was the unreliability of catgut at that time. Under the use of the suture of Dr. Emmett, which penetrated the connective tissue and skin or mucous membrane before entering the sphincter, there were many failures. We all succeed now because we bury the separate stitch, closing other tissues over it, whether we splint the sphincter with Emmett's stitch or not.

Trusting that you will allow of this correction, I remain,

Very truly yours,

GEO. ERETY SHOEMAKER.

JULY 2, 1912.  
1831 CHESTNUT ST.,  
PHILADELPHIA PA.



## AN OBSTETRIC ACCIDENT.

TO THE EDITOR OF THE AMERICAN JOURNAL OF OBSTETRICS.

DEAR SIR:

An unusual case presenting some interesting features of importance to obstetricians has lately passed through my hands, and may be of value to others, as it has been to me.

Being called to attend a ii-para, I was unable to make a correct diagnosis of the fetal position. Being uncertain I chose, rather to wait and watch. After the head was born, external restitution was very much delayed, and I became anxious lest I should lose the child. I therefore went on the assumption it was a L. O. A. position, this being the most common position, and produced external restitution myself. Imagine my shock on finding it was in reality a R. O. A. position, and that I had virtually twisted the child's neck.

Delivery was completed uneventfully, but the child cried steadily for thirty-six hours after it had been resuscitated. Then symptoms of ultracranial pressure came on, including nystagmus, trismus, persistent vomiting, and a mild degree of opisthotonus.

Temperature was subnormal for the first two days, but gradually rose and with all the pressure symptoms becoming more marked, there were symptoms of a meningitis appearing.

On account of persistent vomiting, the child was given hexamethylenamine gr. i. in suppository form and under this the temperature slowly subsided. But the pressure symptoms continuing, the parents took the child, unknown to me, to another physician, who promptly claimed it was merely a case of malnutrition and suggested a diet of modified cow's milk. This the child could not retain, as was to be expected, and upon my suggestion, they consulted with another physician who was appraised by me of the conditions existing up to this time.

He concurred in my diagnosis of a hematoma of the base of the brain.

Treatment during this time was entirely symptomatic, consisting of bromides to quiet the intense restlessness, and hexamethylenamine ward off meningitis, and a diet of peptonized milk per rectum.

To-day, after eighteen months, this child is stout and strong, and apparently none the worse for the error made.

This case shows at least two things: first, the great importance of a correct diagnosis of the child's intrauterine position, and second, the folly of attempting to treat such a case without a thorough knowledge of all the events leading up to the present condition.

B. KAUFMAN.

MONEYSAILLE, CALIFORNIA.

## REVIEWS.

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"DER GYNAKOLOGISCHER OPERATIONSKURSUS." With Especial Reference to Operative Anatomy, Pathology and Bacteriology. In 16 Lectures. By DR. WILHELM LIEPMANN, Berlin. Second revised and enlarged edition, with 409 illustrations, Many in Color. Price 24 Marks. Berlin, 1912. August Hirschwald.

The fact that a second edition of Dr. Liepmann's book has been called for within a period of less than two years, affords the best kind of evidence of the reception which the book has met with and all the favorable comments attending the appearance of the first edition may be repeated in connection with the second. Liepmann's manner of presenting the subject makes it of general interest to the reader, whether he be student or practitioner, and the various difficulties and technical details of gynecological operations are simply and clearly elucidated, both by the text and the illustrations. The new matter consists of a chapter on the relations of the female sexual organs to the intestinal tract through reduplications of the peritoneum and likewise a more complete description of the "inter tubercular incision." A number of new illustrations have also been added. The work presents in a very graphic form, modern German gynecological endeavor and as such the book is certainly worthy of the attention of American gynecologists.

SYSTEM OF INTERNAL MEDICINE. Edited by PROF. DR. L. MOHR, Direktor der medicin. Poliklinik zu Halle (Saale), und PROF. DR. R. STAEHELIN, Direktor der medicin. Klinik zu Basle. Erster Band. Infektionskrankheiten. Mitt 288 zum Teil farbigen Textabbildungen und 3 Tafeln in Farbendruck. Julius Springer, Berlin, 1911.

This, the first volume of the new system of medicine edited by Prof. Mohr and Prof. Staehelin, treats of the infectious diseases, the other volumes which are to be issued shortly covering the following subjects: 2. diseases of the respiratory and circulatory systems and of the mediastinum; 3. diseases of the organs of digestion and of the kidneys; 4. diseases of the genito-urinary system and of the glands of internal secretion; metabolic and constitutional disturbances; diseases of the blood-forming organs; neuromuscular diseases; intoxications; diseases due to physical influences; 5. diseases of the nervous system; 6. borderland of internal medicine and surgery, with chapters on gynecology, ophthalmology, and otology. In its point of view the

book differs quite markedly from former systems, the purpose of the work being to correlate the numerous facts which have been brought out in recent years by bacteriological, serological, physiological, and metabolic studies on internal diseases, or, as stated in the preface, "while not neglecting pathological anatomy to base the presentation especially on pathological physiology"; and in this first volume on the infectious diseases the emphasis is laid throughout on bacteriological studies of the various infections. One feels perhaps that too much space is at times devoted to matters of bacteriological technic and methods of differentiating various organisms, but there is certainly no other single volume in which the results of blood culture are so well presented as in this. The most typical articles are those by Prof. Jochmann of Berlin on the septicemias, and by Prof. Schottmüller of Hamburg on typhoid fever. The chapters on the exanthemata by Prof. Rolly of Leipzig are less distinctive as in these diseases but little of bacteriological interest has thus far been brought out. On the other hand, the chapter on infantile paralysis by Prof. Müller of Marburg gives a most interesting review of the recent experimental work on this disease as well as numerous statistics as to its epidemiology. All of the authors have made free use of condensed case histories by way of illustration, and numerous curves have been inserted to show the various types of fever and leucocytosis. The sections devoted to therapy while satisfactory as far as they go are rather lacking in detail. The book is on the whole an excellent presentation of the more recent type of studies on the infectious diseases; and the subsequent volumes, especially those relating to the diseases of the circulation and metabolism, will be awaited with interest.

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## BRIEF OF CURRENT LITERATURE.

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### OBSTETRICS.

**Outdoor Treatment of Puerperal Infection.**—For the past five years outdoor treatment of puerperal infection has been the routine in the Boston City Hospital. This E. B. Young and J. T. Williams (*Boston Med. Surg. Jour.*, 1912, clxvi, 405) report as having reduced the mortality from 44.6 per cent. to 24 per cent. They say that this treatment probably exerts its action chiefly by increasing the amount of hemoglobin in the blood. Sunlight is probably quite as important as fresh air. Curetage is contraindicated in puerperal infection, because it increases the mortality nearly 10 per cent. A single intrauterine



douche of sterile salt solution should be the only local treatment, and some writers deny the value of even this. Antistreptococcic serum and vaccines have not proven of much value. The outdoor treatment is the most effective known at present for puerperal infections.

**Viability of the New-born.**—L. Tissier (*Jour. des sages-femmes*, June 1, 1912) discusses the legal aspect of viability, in its relations to inheritance and other matters. It is necessary to have some sure criterion as to whether the child is viable. The author considers especially abortions, and the period of pregnancy when a child becomes viable. Vitality should not be confused with viability. The nonviable should be classified as follows: Monsters, such as anencephalus, and fetuses otherwise congenitally unfitted for life; infants infected with a death-dealing germ before birth, as syphilis; abortion products. The law has appointed the end of the sixth month as the period at which the child becomes legally viable. The author cites a case in which the infant is alive as a result of the use of the incubator and gavage, and who was undoubtedly conceived less than six months before abortion took place. He considered it necessary to revise the standard of legal viability to suit such cases.

**Blood Platelets in Normal Women, Obstetrical Patients and the New-born.**—Platelet counts by M. E. Morse (*Boston Med. Surg. Jour.*, 1912, clxvi, 448) show that in some normal women, but not in all, there is an increase in the platelets accompanying menstruation. During the latter half of pregnancy most primiparæ have a high normal or an increased platelet count, while multiparæ usually show no rise. There are no special changes in the platelets during labor or the early days of the puerperium. At the end of the first week there is an increase which does not seem to be dependent upon lactation. In eclampsia and preeclamptic toxemia the platelets may be high, low or normal, and they may be greatly increased during recovery. After postpartum hemorrhages of considerable size, the platelets show a moderate rise, with a maximum occurring late in the puerperium. The platelets may be low after prolonged labors terminated by operation. In case of short uncomplicated obstetrical operations done when the patient is in good condition, the platelets follow the same curve as in a normal labor and puerperium. In uncomplicated abdominal and vaginal operations there is in some cases a transitory rise of the platelets following operation. Scopolamine-morphine, used during labor, causes no changes in the platelets. The number of platelets at birth varies greatly, being sometimes high and sometimes low. After the end of the first week, however, these differences disappear and in early infancy the platelets are numerous (350,000 to 450,000). The platelets show a marked increase in icterus neonatorum. In hemorrhagic disease of the new-born there is no diminution of the platelets at the onset, but a posthemorrhagic rise with a late maximum. In skin lesions of early infancy the



platelets may be high or rather low, depending on the condition of the child.

**Combined Pregnancy.**—Combined, or simultaneous extra- and intrauterine, pregnancy is comparatively rare. R. H. Lucy (*Jour. Obst. Gyn. Brit. Emp.*, 1912, xxi, 144) records a case in which, apparently, leakage of the gravid tube was followed seven hours later by its rupture and a massive hemorrhage—causing extreme collapse and the onset of uterine contractions—resulting in the birth of one four months' fetus per *vias naturales* eight hours later. Operation was not undertaken until twenty-three hours afterward, or sixty-two hours after the first signs of intraabdominal hemorrhage, and death occurred on the table.

**Prolapse of the Uterus and Pregnancy.**—B. Solomons (*Jour. Obst. Gyn. Brit. Emp.*, 1912, xxi, 155) says that it is difficult to lay down any definite rules for the treatment of prolapse and pregnancy, but the following seem to be rational: 1. In an ordinary case pessary treatment. 2. In a case where the pessary does not correct the displacement, having regard to the danger of abortion and septic infection of the prolapsed uterus, either perineorrhaphy or a thorough curative operation for the prolapse. 3. In a case where infection has occurred, after a thorough cleansing of the cervix the uterus should be emptied. If the uterus is septic, hysterectomy with drainage should be practised. Vaginal suspension is strongly recommended for the cure of mobile uterine displacements, especially for patients who require other vaginal plastic work. The operation has a large percentage of cures, and tends to no untoward symptoms in pregnancy, labor or the puerperium. These statements are borne out by the replies received by the writer from twenty-six former patients of the Rotunda Hospital. Of these, nineteen were well since the operation, one was relieved for some months, three were fairly well and three were not relieved. All but five considered themselves cured; one had had two babies since the operation; seven had had one baby; one had had six miscarriages, one had had two miscarriages, four had had one miscarriage. There was no dystocia in any of the cases.

**Treatment of Acute Puerperal Inversion of the Uterus.**—Almost all text-book writers urge immediate replacement of the inverted uterus in these cases. M. H. Phillips (*Jour. Obst. Gyn. Brit. Emp.*, 1912, xxi, 159) maintains that the mere displacement should be ignored until shock has been satisfactorily treated. He records three cases treated upon this principle and analyzes 184 collected chiefly from the English literature. Of forty-three deaths among these, forty-one took place within a few hours. The figures also show that immediate replacement of the uterus is followed by fatal results in 21 per cent. of cases. On the other hand, in the cases which were allowed to become chronic only two out of forty-seven died; less than 5 per cent. The writer advocates an intermediate course. The shock should be energetically treated by saline infusions and injections of

pituitary extract and morphia. In a few hours' time, when the patient has rallied, she should be anesthetized and the uterus replaced. At the same time it is wise to repeat the saline infusion, and any other stimulating measures which may be considered necessary.

**Pregnancy after Bilateral Pyosalpingitis.**—H. Gradl (*Zent. f. Gyn.*, April 27, 1912), referring to the rarity of pregnancy after double seated pyosalpinx reports a case in which within four months after double pus tubes were diagnosed during a laparotomy, the patient became pregnant and subsequently went through a fairly normal labor and uneventful puerperium. A rupture of the pus sac had taken place into the rectum during the acute stages of the salpingitis and this discharge of pus continued into the middle of pregnancy. The author believes that the impregnated ovum must have found its way either through one of the tubes which healed spontaneously or that the rectal sinus permitted a communication between the ovary and the closely adherent tube, so that a portion of the ovary projected into the lumen of the tube.

**Contracture of the Uterus During Labor Necessitating Hysterectomy.**—M. Sauvage (*Bull. de la Soc. d' obst. et de gyn.*, April, 1912) details a case in which after the removal of a fibroid which obstructed the parturient canal during labor, delivery could not be accomplished on account of a firm contracture of the uterine wall, due to retraction of the fibers. Examination was made of the removed uterus, and there was found a generalized contracture of the fibers, with formation of a thick, resisting ring which necessitated a Cesarean section. The author believes that in such cases there is a transformation of the muscle consisting of hyperfibrillation, comparable to physiological tetanus.

**Urodiagnosis and Uroprognosis by means of Perchloride of Iron in Severe Vomiting of Pregnancy.**—V. Le Lorier (*Bull. de la Soc. d' obst. et de gyn., de Paris*, May, 1912) finds that in cases of severe vomiting of pregnancy one may, by certain tests of the urine, predict whether the attack will be fatal or so severe as to necessitate the induction of premature labor. By the test of perchloride of iron applied to the urine we get a reaction with acetyl-acetic acid in distilled water. The gravity of the vomiting is in relation with the intensity of the color reaction. When intense acidosis appears in the course of pregnancy it is not illogical to suppose that intravenous injections of alkaline water containing carbonate of soda may be employed and give good results in the neutralization of the circulating acid.

**Elaboration of the Albumins of the Foods in Pregnancy.**—J. Lemeland (*Arch. mens d' obst. et de gyn.*, May, 1912) has examined the method of elaboration of the albuminous materials of the food during the pregnant state with reference to the value of the milk diet, studying the elimination of nitrogen and its retention. During the use of a milk diet, as well as a mixed diet, the woman retains nitrogen in the last months of pregnancy.

This nitrogen is not retained under the form of urea in the blood on a milk diet, but urea is somewhat reduced. It is retained in a form utilizable by the different organs and for the development of the fetus during its last days of intrauterine life. Milk causes an increased elimination of urea and lessens the amount of urea in the blood.

**Presence of Choriovillous Antibodies in the Early Months of Pregnancy.**—Fieux and Pierre Mauriac (*Ann. de gyn. et d'obst.*, May, 1912), has studied the presence in the blood of the pregnant woman of choriovillous antibodies during the early months of pregnancy, in thirty-three cases. He finds that in many women the hemolyzing power of the blood is diminished in such cases is found in early pregnancy. Perhaps the blood also possesses antihemolytic properties. The sero-reaction and sero-diagnosis are found possible in all these cases, and may become a practical manner of determining the presence of pregnancy in obscure cases.

**Vaginal Puncture of Obstructing Ovarian Cysts in Labor.**—M. Lepage (*Ann. de gyn. et d'obst.*, May, 1912) thinks that in the treatment of ovarian cysts obstructing delivery their puncture has a definite place. Although he would not advocate its use in all cases, preferring removal of the cysts whenever possible, there are occasions in which the presence of the cysts is not discovered until labor has begun, and when delivery must be attained if at all by the immediate removal of the contained fluid. The author carried out successfully this operation in a primipara, the large cyst occupying the excavation of the pelvis and entirely preventing engagement of the fetal head. The cyst was unilocular. Puncture allowed delivery and the cyst never refilled.

**Tentorium Lacerations in the New-born.**—Bauereisen (*Munch. med. Wochenschr.*, May 7, 1912) has studied this subject from the autopsy findings of a series of eleven cases of fetal death from this condition, which was present in forty-seven stillbirths out of 667 labors. In calling attention to the frequency of the occurrence, the writer shows the necessity of exerting extreme care in doing any forceps or version operations and likewise that in the treatment of the fetal asphyxia after operative or difficult labors, conservative methods should be employed. This includes the freeing of the air-passages from all obstructive blood and mucus and keeping the child in warm water rather than a resort to spanking or Schultze's swinging as these measures will tend to increase any slight lacerations which may be present.

**Cholesterinogenic Function of the Corpus Luteum.**—A. Chauffard, Guy Laroche, and A. Grigaut (*Arch. mens. d'obst. et de gyn.*, May, 1912) have made careful chemical and histological researches with reference to the function of the corpus luteum, making use for that purpose of animals which were known to be pregnant. He considers this a gland of internal secretion, its evolution being temporary and periodic. There is an evident



relation between the evolution of the corpus luteum and the chemical modifications which take place in the blood of the pregnant woman as to their content in lipoids, and in the course of the different phases of genital life. During the first seven months of pregnancy most women have more than 2 grams of cholesterin in the blood. During the two months preceding labor there is a constant hypercholesterinemia, which after labor gradually diminishes to normal. In the corpus in a state of evolution and of regression the cholesterin becomes deposited. The author finds that the corpus luteum is a temporary gland, an adenomatous focus of cholesterinogenesis. This is but one of the centers for the production of cholesterin. Cholesterin is not a lipoid indifferent to the organism; it has antitoxic and antihemolytic properties of considerable importance. The presence of cholesterin in the pregnant woman has a relation to the frequency of cholelithiasis in women after the menopause. The suprarenals and corpora are the principal producers of cholesterin and supplement each other. The suprarenal is a permanent gland, the corpus luteum is its temporary assistant.

#### GYNECOLOGY AND ABDOMINAL SURGERY.

##### **Relation of Pelvic Disease in Women to Osteoarthritic Joints.—**

W. A. N. Dorland (*Med. Rec.*, Mar. 16, 1912) says that a prolonged maintenance of one position, as stooping, standing, lying, or sitting, will often result in a strain of the sacroiliac joints. It can hardly be doubted that many lumbosacral backaches may be explained in this way. Thus, prolonged dorsal decubitus after childbirth, in protracted illness, or after abdominal section, produces a strain of the sacroiliac ligaments with resultant chronic aches and pains. Grave changes in the pelvic bones themselves, as the softening due to rachitis and osteomalacia—the latter generally developing subsequent to a gestation—are responsible for strains and distortions of their synchondroses with consequent backaches and referred pains that become almost intolerable. Relaxation of the pelvic joints occurs in pregnancy and to a slight degree during menstruation. In both cases this is the result of increased vascularity of the pelvis. The symptoms of joint-congestion at these periods are intermittent, appearing with the flow, the pain being slight in most instances and located in the abdomen and small of the back, but at other times amounting to a severe sciatica. It is probable that in any disease of the pelvic organs with marked circulatory disturbance the joints may become relaxed. The greater the pelvic congestion the greater the vascularity of the joints. Therefore, pelvic tumors, uterine myomata and fibromata, and ovarian cysts are very prone to be complicated, to a greater or lesser degree, by this articular change. Some of the severer cases of pelvic relaxation originate at the time of the delivery of a child, especially if the labor has been a difficult forceps



extraction. The symptoms produced by relaxation of the pelvic joints include restriction in locomotion as well as in the various movements of the spine, and the development of persistent pains in the small of the back, lumbago, sciatica, and pain in the course of the genitocrural nerve. Infection of the pelvic joints may be caused by the gonococcus, pneumococcus, streptococcus, and staphylococcus, and pyogenic infection may occur from uncleanly tears of the cervix and perineum. The symptoms may be those of a simple synovitis or of severe suppuration. Injury of the symphysis, relaxation or anyklosis, may follow symphyseotomy. If the symphysis be ankylosed the movement of the sacroiliac joint is lost, and the jar in walking is directly transferred to the spine; while an unduly loosened symphysis permits too free movement at the sacroiliac synchondroses and destroys the stability of the pelvic girdle. Finally, malignant disease may invade these articulations.

**Operation for Prolapsus Uteri.**—B. C. Hirst (*Jour. A. M. A.*, 1912, lviii, 846) says that success in the treatment of prolapse of the uterus with partial or complete inversion of the vagina is due to certain details of operative technic. The problem presented is to shorten the elongated lower uterine segment, to shorten the elongated cardinal ligaments of the uterus, to insure an anterior position of the latter, to restore the anterior and posterior vaginal walls and their subjacent structures *ad integrum*. This can be done by the following operative technic: The cervix is seized with double tenacula in each lip; the uterus is pulled as far out of the body as it will come. A longitudinal incision is made in the anterior vaginal wall its whole length. A circular incision is made around the cervix. The anterior wall is dissected free from the bladder and the uterovesical ligament is cut. The cervix is amputated above the internal os; the cervical canal is then dilated and the uterus curetged. The lateral and posterior sutures for an amputated cervix are inserted but not tied. A curved needle threaded with No. 3 chromicized catgut (40-day) is passed with the point turned downward through the base of the left broad ligament, then transversely through the anterior wall of the corpus uteri as high as possible without opening the peritoneum; then through the base of the right broad ligament, again with the needle point down. By making this ligature tense and pushing the detached bladder up, the laterally dislocated edges of the fascia are plainly marked; they are brought together in the middle line by figure-of-eight sutures of catgut No. 3 (40-day), the needle always being inserted from above downward to avoid the ureters. These sutures are usually three or four in number. When they are tied, the orifice through which the bladder prolapsed is firmly closed. The redundant vaginal wall is cut off. The anterior sutures for an amputated cervix are inserted. The cervical sutures are tied. A few transverse sutures unite the anterior vaginal wall over the sutures joining the pelvic fascia. The posterior vaginal wall and the

pelvic floor are strengthened by an extensive Hegar operation as follows: A fold of mucous membrane in the middle line just below the cervix is seized by a hemostat. Two Allis intestinal forceps are fastened to the labia majora a trifle above the original level of the posterior commissure of the vulva. By pulling the center of the posterior vaginal wall to one side with tissue forceps, it is possible to draw a straight line with a knife from the hemostat to one Allis forceps. The same is done on the other side. The triangle thus marked is partly stripped, partly dissected off. The upper part of the triangle is closed by a double-tier catgut suture, the middle portion by transverse deeply inserted vaginal sutures of silkworm-gut, shotted to facilitate their removal. The perineal body and the lower third of the triangle are united by transverse silkworm-gut perineal sutures, knotted on the external skin surface of the perineum.

**Specific Treatment of Pyosalpinx.**—H. J. Farbach (*Med. Rec.*, Apr. 6, 1912) reports very unfavorable results from the specific treatment of twenty-five acute and chronic pyosalpinx. All the ordinary means of treatment were employed in addition to serum and vaccine, including in acute cases preliminary saline catharsis followed by an opiate, elevation of the head of the bed, hot applications to the lower part of the abdomen, and later, hot iodine vaginal douches twice a day, urotropin in large doses, and restriction of food and water until pain and tenderness are reduced or absent. The gonococcic serum contains specific antibodies, and when used should be used for effect. Give 2 or 4 c.c. at the initial injection; if no benefit has been derived in three or four hours double the dose, and double again three or four hours later if satisfactory results have not been obtained. The benefit to be derived from the serum must come in the first twelve or thirty-six hours after its injection. Long, drawn-out, small injections of serum are a waste of time and money. As a rule, give with the initial injections of serum a moderate dose of mixed gonococcic vaccine. As soon as it is possible make an autogenous vaccine for use at subsequent treatments. Under this treatment, within twenty-six or forty-eight hours, the patient is comfortable, temperature and pulse are within proper limits, local tenderness and rigidity are reduced to the minimum; but the patient must be kept in bed and as quiet as possible for ten days. The vaccine should be repeated every seventh day for at least five doses. This is an outline of the treatment I use in the acute conditions. For cases seen in the interval between attacks, iodine douches, urotropin internally, and quiet are recommended. Here in nearly every instance an autogenous vaccine is prepared for the initial injection. Following this injection from six to twenty-four hours the reaction begins. In some instances the first reaction is severe. Pain, almost of the intensity of past attacks, is present, the temperature and pulse

go up and the patient is very uncomfortable. In cases where there is uterine or cervical involvement also, it is common to have a profuse bloody discharge during this reaction. The reaction should not extend over twenty-four to thirty-six hours unless the vaccine dosage has been too large. If a continued reaction is produced either break it with a small dose of vaccine or lengthen the interval before the next injection and reduce the dose. As the reaction passes off the subjective symptoms disappear and the patient experiences less inconvenience than before the injection. As a rule these cases should be kept quiet two days after the reaction has passed. Subsequent reactions as a rule are not severe, but patient should be kept quiet for twenty-four or thirty-six hours. The size of the dose depends on the extent and virulence of the infection and the weight and physical condition of the patient. Continue the injections every seven days until objective and subjective symptoms have disappeared, and then as a rule give two more injections.

**Relation of Gonorrhea to Pelvic Disease.**—G. W. Kaan (*Boston Med. Surg. Jour.*, 1912, clxvi, 556) says that statements which claim that gonococcus infection in woman is responsible for 60 per cent. or more of the operations for pelvic inflammation are decided exaggerations and should be modified in the interest of truth and proper teaching. The statement that 45 per cent. of the cases of sterility are due to gonorrhea is also discredited by the reports of Bumm and Erb. The hospital practice of the best gynecologists of Boston indicate that the ratio of all operations upon the Fallopian tubes are only about 5 per cent. to 16 per cent. of all gynecological operations; and a deduction must be made from this to arrive at the proportion which is due to the gonococcus only. The proportion of all operations upon the tubes to all abdominal operations (excluding appendectomies and those not upon the sexual organs) varies from 19 per cent. to 37 per cent. and up to 50 per cent. in the case of the Boston City Hospital. The proportion of gonorrheal to other pelvic inflammatory disease it is not possible to estimate from the hospital reports; but Gebhard's figures of bacterial examinations shows about 22 per cent. of proven gonorrheal infection.

**Vicarious Menstruation.**—D. M. Greig and J. A. Kynoch (*Jour. Obst. Gyn. Brit. Emp.*, 1912, xxi, 166) report cureting a suppurating lymph-node which was discharging through a sinus of the cheek in a girl of eight years. A small sinus persisted and broke down at intervals after closing. The patient, when fourteen years of age, was stated to have developed periodic bleedings, which had recurred during the preceding five or six months, from the small pin point opening in the upper part of the scar of the old operation. During this time the periodicity of the bleeding had not been a feature, at least no note was taken of how often it occurred, but it seems to have been oftener than once every month. Fifteen months later the sinus had soundly healed, and there had been no bleeding from the cheek for four months,



but there had been at equal intervals on four occasions a discharge of blood from the inner canthus of the left eye, where there was never an appearance of any solution of continuity. Bleeding from the inner canthus continued every month for six months with peculiar regularity until the normal menstrual flow had become established. Since then there had been no bleeding from the face nor had the gland given any further trouble.

**Virginal Metrorrhagias.**—Paul Dalché (*Rev. mens. de gyn. d' obst. et de ped.*, May, 1912) gives us a study of the causes of metrorrhagia and menorrhagia in young girls. In many of these cases there is no pain at all, yet considerable hemorrhage that is abnormal either in quantity or in time of occurrence. There seems to be no anatomical basis to be found in the uterus or pelvic organs, outside of the ovary itself. The author believes that here there is a result of ovarian ataxia; a phase of insufficiency succeeds one of hyperfunction, and vice versa. Some of these cases seem to be due to a too rapid and sudden growth of the body and maturation of the ovary. In other cases there is a true hereditary influence, the mother having undergone similar troubles. This condition may be a symptom of a family degeneration; it may result from a latent tuberculous condition, from hereditary syphilis, or from a disturbance of the glands of internal secretion. There may be a hypothyroidism disturbance of the functions of the hypophysis, or of the suprarenals. When metrorrhagia is accompanied by dysmenorrhea there may be hyperemia of the ovaries, or a true menstrual ovaritis even going on to ovarian apoplexy or hematocele. Here there is severe pain in the ovary at the menstrual period and in defecation or urination. A menorrhagic form of chlorosis and a true chlorosis are found in young girls. Metrorrhagia not due to genital disease may be found in the subjects of neuroarthritism, struma, chronic constipation, mitral stenosis, and hemophilia. The condition may also be found in connection with true metritis, displacements, and adenoma of the mucous membrane of the uterus. As to the treatment of these various forms of hemorrhage, each case must be studied by itself and treated according to the causation found. In many cases ovarian, thyroid, or mammary extract carefully used and guarded with observation of its effects may be of great value. For the immediate attacks complete rest in bed, hot douches, ergot and the usual measures must be used.

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### CORRECTION.

In the JOURNAL for July, page 33, Dr. Ross McPherson is designated as "Consulting Surgeon to the Lying-In Hospital" instead of "Attending Surgeon."



# DEPARTMENT OF PEDIATRICS.

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## ORIGINAL COMMUNICATIONS.

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### THE TREATMENT OF SUMMER DIARRHEAS.\*

BY

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RATIONAL therapy demands a clear conception of the nature of the morbid process requiring correction. Before entering into the treatment of the diarrheas of children, it might not be amiss to say a few words regarding the classification of this group of diseases. The basis for such classification has been in succession the pathology of the disease, its assumed etiology, the character of the stools, and the clinical symptomatology. One of the oldest and best known of these is that of Widerhofer and Kundrat, proposed at the time when pathology promised to solve the problems of disease. They divided the acute intestinal disturbances into dyspepsia, catarrhal enteritis, follicular enteritis, and cholera infantum. It has become clear, however, that differentiation of the various affections named can only be made with certainty after a postmortem examination of the gastrointestinal tract. A pathologic classification is untenable, because during life we have no means of knowing the extent and severity of the pathologic changes that are taking place in the gastroenteric tract. Perceiving the inadequacy of pathology as a basis for nomenclature in this class of cases Escherich in the early days of the bacteriologic era, proposed a classification founded on a bacteriologic basis. He divided the diarrheas into infectious and noninfectious. His studies of the bacteriology of the feces pointed to the occurrence of important changes in the intestinal tract in the infectious diarrheas. Since then and up to very recent date, the conception that summer diarrhea is due almost exclusively to bacterial infections has held undisputed sway, yet with very few exceptions, the attempt to isolate specific organisms from the stools has not been successful. In view of this fact, it is evident that an etiologic classification at the present state of our knowledge must necessarily be unsatisfactory. Recently Escherich's view of the predominant rôle played by bacteria in the production of diarrhea has lost ground, more

\* Read before the Medical Society of the Borough of the Bronx, June 12, 1912.

especially in Germany. The work of Finkelstein, Czerny and Keller, and Pfaundler has led to more and more attention being paid to the chemical aspect of the subject. Study has been concentrated on the relation between food and the processes of its assimilation. At first casein was accused by Biedert of being concerned in the etiology of diarrhea. Somewhat later Czerny and Keller's work pointed to the fats as being the important etiologic factor. Still later Finkelstein found that the carbohydrates by the fermentative changes they undergo produced diarrheal stools and symptoms of intoxication. More recently he has modified his views somewhat, his present opinion being that these disturbances are due to the sugars and salts. As a result of his researches, he has proposed a new classification which has been quite generally adopted in Germany. It is partly based upon clinical symptomatology and partly upon functional changes in the process of food assimilation. Under this conception we no longer speak of gastrointestinal diseases, but of nutritional disturbances accompanied by gastrointestinal symptoms. In these cases there is present what Finkelstein aptly calls the paradoxical reaction. The food instead of acting (as it normally does) favorably upon nutrition, seems to become a toxic agent, at times producing serious disturbances of the important functions of food assimilation. Finkelstein divides these disturbances into four stages:

1. Disturbance of balance,
2. Dyspepsia,
3. Decomposition,
4. Intoxication.

By disturbance of balance is understood that condition in which proper and regular gain in weight does not take place despite the ingestion of sufficient quantities of food. In the stage of dyspepsia gastrointestinal disturbances of moderate degree are present. Decomposition is that condition of severe malnutrition in which the functions of food assimilation are so markedly disturbed that the food is no longer taken care of and severe marasmus results. In alimentary intoxication the products more particularly the carbohydrates act as a poison producing marked gastrointestinal symptoms and severe constitutional disturbances. This would correspond to the cholera infantum type of the older classification. According to Finkelstein's conception bacterial infections play only a secondary rôle in the production of the above type of the disease, the chief etiologic factor

being food. These forms are to be carefully differentiated from those in which microorganisms play the determining rôle. To the latter class belong the cases of dysentery due to the *Shiga bacillus*, *ameba coli*, and *streptococcus*.

*Treatment.*—The milder cases of diarrhea which belong to the noninflammatory type of the stage of dyspepsia (Finkelstein), require little else but initial catharsis consisting of castor oil or milk of magnesia and abstention from milk for a period of twenty-four or forty-eight hours. After cessation of the diarrhea diluted skim milk, barley water and sugar may be given in gradually increasing quantities. In most of the cases astringents are unnecessary. If, however, the diarrhea persists after the thorough removal of the decomposed food product from the intestinal tract, 5 to 10 grains of bismuth in mucilage of acacia at intervals of one to two hours is indicated. If abdominal pain, cramps, restlessness or watery diarrhea is present, five or ten drops of paregoric may be added. While these mild cases of dyspepsia (Finkelstein) in the early stages offer a grateful field for therapeutic activity, it is far otherwise with the severer forms of decomposition and intoxication. These not infrequently present difficult problems to the clinician, as with the rather prolonged starvation which is indicated the general condition becomes so enfeebled that the danger of collapse is imminent.

The urgent need of a mode of treatment which, while it ameliorates the gastrointestinal symptoms, at the same time conserves the strength of the patient, led the profession to greet with renewed hopes the announcement by Finkelstein and Meyer of the successful use of such a method. Their previous studies on the alimentary factors concerned in the production of intestinal fermentation showed the predominant rôle played by the carbohydrates and the salts. Decrease or removal of one or both of these important food elements invariably resulted in diminution of intestinal fermentation.

Further studies yielded the somewhat unexpected fact that casein had a pronounced antagonistic action upon carbohydrate fermentation in the intestines. It was shown that in the presence of casein, larger quantities of carbohydrates could be given without producing fermentation.

These observations led Finkelstein and Meyer to prepare a mixture which they call "Eiweiss Milk," consisting of casein and buttermilk. The chemical analysis of this food shows.

	Eiweiss milk	Cow's milk
Proteids.....	3.00	3.00
Fats.....	2.50	3.50
Carbohydrates.....	1.50	4.50
Ash.....	0.50	0.70

A liter of Eiweiss milk contains 370 calories. Finkelstein and Meyer's first full report in the *Jahrbuch für Kinderheilkunde*, May and June, 1910, was based on the successful use of this preparation in 150 cases of dyspepsia, decomposition, intoxication, and various parenteric infections. Their results were so encouraging that many of the German clinics soon began to use albumin milk in the treatment of gastrointestinal diseases. The early reports of Birk, Rollet, v. Reuss, and others, pointed to the fact that an important advance in the therapy of these diseases had been achieved. Practically the only discordant note was that of Braumüller, who on the basis of the meager number of five hospital and nine dispensary cases, came to the conclusion that albumin milk created a diminished tolerance for the sugars. This was shown by the development after the addition of sugar to the albumin milk of a state of chronic intoxication, ultimately producing death.

The writer first used albumin milk in the second half of the summer of 1910. The shortness of the time permitted only a tentative trial of this preparation during that period. The results then obtained nevertheless made a further more extended trial desirable.

This opportunity came with the onset of the diarrhea season of the summer of 1911. All patients admitted to the Children's Service of Dr. Koplik at the Mount Sinai Hospital, suffering from diarrhea were given albumin milk for a period varying from three to fourteen days. From this statement it becomes evident that the data obtained in the present study were derived from an unselected series of cases.

*Mode of Preparation.*—The original directions of Finkelstein and Meyer for the preparation of this food were as follows: A tablespoonful of essence of rennet (or two tablets of rennet) is added to one liter of milk, which is then placed in a water-bath at 42° C. for one-half hour. It is then filtered slowly by gravity without any pressure for about an hour, through cheese cloth. The coagulum is then washed twice in half a liter of water, through a very fine sieve and forced through by means of a wooden club. Then half a liter of buttermilk is added.



The writer's method of preparation is essentially the same as that above described. By placing cheesecloth in the sieve it was found that the casein particles were more readily and uniformly forced through. To make a more palatable mixture, one one-grain tablet of saccharin is added to the liter of albumin milk. At first some difficulty was encountered in obtaining finely divided casein particles. This obstacle was soon overcome with a little experience. At present we have no difficulty in teaching nurses to prepare this food.

*Tolerance.*—With the use of saccharin, little difficulty is encountered in administering this food to children of any age. In only five cases of the series of forty-two was vomiting after ingestion of the food a noticeable symptom. Even in these it rarely persisted for more than a day or two.

*Quantity Administered.*—In general the quantity of albumin milk given, corresponded to that of the usual feeding mixtures prescribed for the respective age. The caloric value of albumin milk being about one-half that of undiluted whole milk it may be readily seen that the caloric needs of the child can be covered almost as well by albumin milk, as by the customary diluted milk mixtures.

*Addition of Carbohydrates.*—In their original paper, Finkelstein and Meyer cautioned against the too early use of carbohydrates. They advised that carbohydrates should not be added before the stools have assumed their normal appearance. In their recent paper in the *Muenchner medizinische Wochenschrift*, 1911, page 340, they attribute some of the unfavorable results obtained by themselves and other observers to unnecessary timidity in this regard. Now they advise the addition of carbohydrates in the form of malt soup or Liebig's Extract of Malt, as soon as the quantity of milk represents one-tenth of the body weight, even when the stools have not become entirely normal. In our series, maltose was added to the albumin milk from the second to the eleventh day, when proper gain in weight did not appear.

*Duration of Albumin Milk Feeding.*—This varied from two to fourteen days. In seven cases it was given from two to three days only. In three of these the diarrhea had disappeared by that time. In the other four it was continued up to the time of death. Most of the German observers have administered the albumin milk for a considerable period (four to six weeks). The service at the hospital being an acute one, it was found impossible to continue it for such a length of time. Moreover,

it was considered advisable to observe the patients in the hospital during the transition period from albumin milk to ordinary milk mixtures. In no single instance did a relapse occur after the cessation of albumin milk feeding, though the patients were not infrequently kept in the hospital for a week or more on various milk mixtures.

The usual procedure was to administer in the severe cases weak tea for a period of two to six hours before the albumin milk feeding was begun. No castor oil or other laxatives were at any time given. In the less severe cases, albumin milk was used from the first. It was stopped as soon as the stools became normal.

*Medication.*—Intestinal astringents or opium preparations were almost never employed. When indicated, stimulants, such as camphor, caffeine, and subcutaneous infusions, were given.

*Effect on the Stools.*—In most of the cases a change in the character of the stools occurred within three to five days. The offensive odor of the stools disappeared first, the number diminished, and they assumed a grayish pasty appearance. In nine cases, most of them of the severe type, the improvement in the character of the stools did not occur within the first five days, though ultimate improvement did take place. In four severe cases no effect upon the stools was noticeable at any time.

*Effect on the General Condition.*—In over one-half of the severe cases, improvement in the general condition was seen within two to five days of the initiation of albumin-milk feeding. In some the change was striking. The extreme prostration, apathy, glassy sunken eyes, and pinched features disappeared with remarkable rapidity, at times within twenty-four hours.

*Effect on Weight.*—Albumin milk, unless carbohydrate is added, does not ordinarily produce a gain in weight. In most cases, however, it checks the marked losses previously sustained by the patient while under the customary treatment. In the present series quite a number of patients showed a gain of 4 to 6 ounces during the period of albumin-milk feeding. Loss of weight was, however, also seen, but in only two cases was the loss more than  $1\frac{1}{2}$  pound. The gain in weight would probably have been greater, had maltose-dextrose been more frequently added.

*Mortality.*—There were nine deaths in this series of forty-two cases, twenty of which belong to a very severe type of the disease,

a mortality of 21 per cent. Excluding four of the cases in which the albumin milk was given for three days or less, owing to the fact that the children were admitted to the hospital practically moribund, we have left five deaths which represents a mortality of 13 per cent.

Of the forty-two cases, there were sixteen patients below six months of age, eleven of which were bottle and five breast-fed. Seven of these belonged to the severe type of the disease, and of these three died. I wish to call special attention to those very young infants among whom the largest proportion of deaths are usually seen. Under albumin feeding these young infants seemed to do as well as the older children. I will not burden you at this time with more detailed statistics nor with citation of cases. Statistics, unless covering a very large series of cases, are not nearly as valuable as bedside observation and impression.

From the generally favorable results obtained in this series, and more especially from the bedside impressions received of the action of this food, the writer feels justified in concluding that a distinct advance has been made in the therapy of the diarrheas of children.

Its special indication is found in those cases in which marked emaciation has taken place, as a result of prolonged withdrawal of food. By the administration of albumin milk in these cases a food of considerable caloric value is supplied, and further marked loss in weight is checked during the period of recovery from the gastrointestinal disturbance. When available its use is also recommended in the ordinary mild cases of diarrhea.

For the present at least, its use in private practice will remain limited on account of the time and skill required in the preparation of the mixture. Moreover, the prejudice against the use of a sour and curdled milk will have to be overcome. In this city it has recently become possible to obtain the food already prepared, thus removing the greatest obstacle to its employment in private practice.

Mothers and nurses should be instructed to shake the bottle thoroughly before using to prevent the plugging of the nipple with casein curds. When we consider that the term "diarrheal diseases of children" covers a variety of morbid conditions, having nothing in common but the presence of abnormal stools, it becomes evident that a remedy for which such beneficial results are claimed, requires more than two years of application before a final decision as to its value is reached. All that we are

at present justified in saying is that its use thus far has yielded gratifying results in the hands of a considerable number of observers.

I wish to take this opportunity of thanking Dr. Daniel Poll, interne at the Mt. Sinai Hospital, for his assistance in this study.  
30 WEST 88TH STREET.

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## TREATMENT OF THE ACUTE STAGE OF POLIOMYELITIS BEFORE THE APPEARANCE OF PARALYSIS.

BY

JACOLYN VAN VLIET MANNING, M. D.,  
Brooklyn, New York.

TREATMENT of the early stage of poliomyelitis is of great importance and should not be delayed during the stage of invasion while the diagnosis is yet doubtful, for the diagnosis of this disease in many instances is not made, or made but tentatively, until the oncoming of paralysis.

The brief hours which intervene between the onset of poliomyelitis and the appearance of paralysis constitute the physician's only opportunity for preventing disability or death. When the symptoms of acute illness *may indicate* and *do not negative* the stage of onset of epidemic poliomyelitis, the treatment to be promptly instituted consists of: confinement to bed, forced feeding of water and colonic flushings continued until free elimination is established, evacuation of bladder, application of ice to head and spinal column, and the use of calomel followed by carbonated citrate of magnesia.

To secure intelligent co-operation from parents the orders should be explained, and the need of securing immediate elimination of all toxins from the system made apparent to them. Leave written orders.

### GENERAL TREATMENT.

*Early Treatment.*—Forced feeding of water is first aid in these cases. An ounce or more of ice water should be given every fifteen minutes. The object of water given during the acute stage of poliomyelitis is: (a) To dilute the toxins in the blood and spinal fluid. (b) To decrease plus pressure of spinal fluid, by lowering specific gravity of the blood and so checking hyperosmosis. (c) To wash out the stomach by assisting the vomiting. (d) To flush the kidneys and to stimulate the renal function.



This flushing of the system can be aided with repeated colonic lavage, using pure water at body temperature with the addition of dissolved soap if it becomes apparent that the digestive tube is parietic. If no evacuation from the bowels is secured from these measures, a mixture of equal parts of glycerine and magnesium sulphate, added to the enema, will empty the lower bowel; to cleanse the entire tract calomel should be used.

The bladder should be examined; if there is distention, with inability to micturate, catheterize, unless other methods of relief have succeeded.

Place an ice-bag to the spine, and one well against the nape of the neck. Children with the burning fever of the onset of poliomyelitis find some relief from the ice applications, and will ask for the ice when it has been removed. Many of these children present the appearance of heat stroke, and some of them have taken violent means to secure relief from the fever in their veins, notably the twelve-year old boy reported by Dr. Marquardt of La Crosse, who crawled under a garden sprinkler, and was found there in the acute stage of poliomyelitis. Pulmonary symptoms, beyond the increased respiration which is central, contraindicate any but the most intelligent use of the ice-bag in children.

*Isolation.*—When poliomyelitis is suspected the patient should be promptly isolated and this isolation should be maintained. The reasons for this isolation apply with equal force to the benefit of the individual himself, the family, and the community. It conduces to the quiet of the sick room to permit no coming and going, and quiet is most desirable for the convulsive sufferer. Rigid exclusion will protect the patient from contact with any influenzal or respiratory infection, a dangerous and fatal complication with paralysis of the chest muscles. Evidence accumulates that this disease is transmitted by an insect host, and should that host prove to be the bedbug, any visitor to the sickroom might harbor and carry away the agent of transmission. It is believed by many physicians who have dealt with this disease in its epidemic form, that isolation and fumigation will check its spread.

The patient's room should be screened from flying insects, and bare and clean as a hospital ward; if climate and season permit, the isolation is best carried out in a tent with a wooden floor. A screened-in sleeping porch shares with a tent the great advantage of a constant supply of fresh air to lungs which may have

lost, more or less, their power of expansion from paresis of the respiratory muscles. The sudden advent of respiratory paralysis may occur in any case, and preparations for removal to fresh air should be adequate.

*Rest.*—Absolute rest in bed from the onset of the disease is an important measure in the treatment of poliomyelitis. The mildest case may suffer a reinvasion of the attack, and the mortality rate is known to increase, with exertion after onset. In many cases the prostration is so marked before appearance of paralysis that this measure is self enforced. When otherwise, the infraction of the rule may be prevented by ascertaining that a bedpan, and not a commode, is provided, that drinking water is conveniently placed on a chair or low table beside the patient, etc. The mere looking after such details by the physician, impresses on the mind of the attendant that the orders are more than routine. When extreme restlessness is manifest, sedative measures of value are the employment of the ice-bag, cool sponging, immersion bath, (given, not taken), and codeine.

*Position.*—A child will show gratitude for gentle changes in position, and it is questionable whether they should be allowed to rest continuously on the back, although many patients with the preceding pain in, and paralysis of, both legs prefer that position. Every case must be studied, and its needs consulted in this matter of position.

It has been advocated to "immobilize the spine during the period of muscular excitability, as we would any acutely inflamed joint with muscular spasm." The disadvantages of permitting a continuous dorsal decubitus are: a possible hypostatic congestion augmenting the spinal congestion of the lesion; the initiation of bedsores, which have given serious trouble when trophic disturbance accompanied the motor and sensory changes; and the very real danger of hypostatic congestion of the lungs, should respiratory paralysis present.

It will be found of advantage to shift the position of the patient occasionally, giving support to the aching extremities while avoiding the use of heat-retaining feather pillows. It is important to ascertain that only sufficient bed covers are employed, and a sheet is sufficient on a warm day. The bed coverings should be suspended over a large cradle in case the weight is in the least irksome to the patient, and the bed so arranged that the eyes are never subjected to direct rays of light. The majority of patients suffer from photophobia, which is easily under-

stood when we recall the relative size of the optic nerve, its great peripheral terminations, and the fact that autopsies have shown that a majority of cases even of the spinal type, present lesions of the cerebral cortex. Direct rays of light, whether natural or artificial, should not fall in the direction of the patient's vision. Movable screens and shades may be utilized so that the patient will have sufficient fresh air.

#### LOCAL TREATMENT.

*Counterirritation.*—Any method of counterirritation is contraindicated in poliomyelitis. Cauterization of the spine, or the application of mustard plasters, or fly-blisters, are methods especially pernicious during the acute stage, when they augment the pain, and render possible the formation of bedsores.

Application of the d'Arsonval high-frequency current to the spine during the acute stage of poliomyelitis is used and recommended by Dr. Henry Frauenthal at the New York Hospital for Deformities. Observing that the primary effect of the application of the high-frequency current in obliterating endarteritis was a blanching of the skin which continued for several moments, the current was applied to the spine in the treatment of the early stage of poliomyelitis, with, in one case, inhibition of further advance of a progressive paralysis and rapid and complete regression. The d'Arsonval current in the hands of Arrhenius of Stockholm has recently been shown to exert an extraordinary stimulus to the metabolism of the living cell.

#### MEDICAL TREATMENT.

The use of ergot and gelsemium is advocated in poliomyelitis to lessen the supply of blood to the congested area of the cord. Ergot, which was formerly said to have a selective action on congested pulmonary vessels and was used to abort pneumonia, is now called on to exert a similar selective action on the vascular supply of cord and brain. If such local action could be obtained it would be undesirable. It is not a lessening of the blood supply that is needed, but more blood, fresh, pure, and regenerating. The study of a section from the lumbar level of the cord of an acute case of poliomyelitis is convincing in this respect. The cut ends of the vessels are not distended; they are choked with a collar of round cells.

*Antipyretics.*—The temperature of poliomyelitis is a measure

of the struggle of the organism against the toxin. It is best aided with hydrotherapy, external and internal. The forced feeding of water, colonic flushings, sponge baths, immersion baths when possible, and the ice-bag are all efficient aids. The temperature will not fall when the bowels are finally moved during the onset of the case, unless paralysis is impending, or the case is happily merging into the arrested type. Hydrotherapy will lower the temperature only temporarily until the fall by crises which precedes the paralysis. Nevertheless, the measures relieve and benefit.

*Sedatives and Analgesics.*—The foregoing remarks about antipyretic drugs during the acute stage of poliomyelitis, apply equally well to the administration of salicylates; they are equally depressing in effect, and their exhibition in these cases I consider dangerous. Bromides, in addition to their depressant action, are irritant to the stomach which should retain as much nourishment as possible. With extreme restlessness, or pain, or both, codeine is the most soothing and least harmful drug which we have for these cases. Morphine or other preparations of opium, may be used with great caution as rectal suppositories, remembering that their use may undo all you have striven to attain, by again checking elimination.

*Internal Antiseptics.*—The internal administration of some preparation of formalin has been advocated during the acute stage of poliomyelitis, and its usefulness would seem to be demonstrated by the fact that the presence of hexamethylenamin has been demonstrated in the spinal fluid of monkeys, one-half hour after administration.

Before summarizing the advantages and disadvantages attending the use of the many mercantile preparations of this drug, we may consider the statements of physicians who have used it.

Hexamethylenamin (urotropin) may have some effect in disinfecting the spinal fluid, but if long continued there is a possibility that the formalin set free may have a hardening effect upon the spinal cord. *Two grains* may be given every two hours during the first two or three days. (Spiller: *Diagnosis and Medical Treatment of Poliomyelitis*, Penn. Medical Jour., Dec., 1911.)

Urotropin was sometimes given and with uncertain results. (Anderson: *Nebraska Epidemic of 279 Cases of Poliomyelitis*, *Pediatrics*, August, 1910.)



Urotropin should be given in full doses well diluted and kept up for quite a while, but watch out for irritation in the urinary tract. (Marvin: Discussion of paper, Infantile Paralysis, Thompson. Kentucky, *Louisville Monthly Journal*, April, 1912.)

It therefore seems a logical remedy (hexamethylenamin) in acute poliomyelitis, the dose to be from 5 to 15 grains every three hours according to the age of the patient, the medication to be instituted at the earliest possible moment. (Bierring: Acute Polio. in Iowa, *Interstate Medical Journal*, Jan. 1912.)

While there is no proof as yet that this drug has any effect in modifying the course of the disease, its use is free from any valid objection, and it is quite generally recommended. (Frost. U. S. P. H. and M. H. S. Public Health Bul. No. 44.)

Fullerton reports a case of medicinal cystitis following its use, with painful, burning, frequent urination, hematuria, and the passing of many small blood clots as well as pieces of bladder membrane several centimeters square. For two nights and three days after the onset of the hematuria the patient continued to pass blood clots and bladder membrane. The urine was demonstrated to be sterile, the symptoms arose after the drug was begun, and cleared up at once, though gradually, after it was discontinued, and there being no other possible etiological factor, all this seems to be conclusive evidence that this was a medicinal cystitis.

The use of hexamethylenamin in poliomyelitis was first advocated, if I am not mistaken, by Preble of Chicago, "in view of our desperate helplessness," in a letter to the *Journal of the Am. Med. Association*. Those who advocate its use to-day claim hexamethylenamin; (a) will break down and liberate free formalin in the tissues; (b) if given by mouth will remain in blood, bile and gall bladder for twenty-four hours; (c) if the dose is as much as 75 grains per day, it will prevent bacterial growth in these passages (Crow); (d) it may remain unchanged on excretion, only liberating formaldehyde after more or less stagnation; (e) it is excreted in the urine unchanged, and breaks down after remaining in the bladder at least one and a half hours; (f) it is recommended in genito urinary affections when catheterization has to be resorted to for any length of time; (g) free formalin has been demonstrated in the spinal fluid of apes one-half hour after administration.

Spiller prescribes 2 grains of urotropin every two hours for two or three days only. I have seen no report which justifies

the use of a larger dosage for children. The drug is administered after solution in a large amount of water.

Hughes of St. Louis, advocates a vigorous course of quinine in poliomyelitis. Quinine sulphate is a powerful internal antiseptic and well tolerated by the economy. The blood during the acute stage of poliomyelitis, is known to be infective. Lacking a specific treatment in poliomyelitis, the use of quinine, while empiric, is justifiable.

*Lumbar Puncture during Acute Stage of Poliomyelitis.*—A quantitative increase in the cerebrospinal fluid is constant during the acute onset of poliomyelitis, and is evidenced by a plus pressure, on lumbar puncture, as well as bulging of the fontanelles, and Macewen's sign. The cerebrospinal fluid drawn during the acute stage has been proven infectious. Theoretically it would seem that the abstraction of an amount of this fluid would relieve tension, and remove toxic material. The majority of recent reports on lumbar puncture during the acute stage of poliomyelitis, whether the tapping was done for diagnosis, or treatment, indicate the method is of therapeutic value. Lumbar puncture is also a valuable diagnostic aid during the onset of the disease and of prognostic value as to the progression and regression of the paralysis. The following is the routine method of lumbar puncture advocated by the New York Health Department: Patient in left lateral position with flexed spine. Paint cutaneous area over lumbar spines with tincture of iodine. Freeze surface with ethyl chloride spray. Puncture in *median line* between fourth and fifth lumbar spines.

The possibility of a needle breaking during lumbar puncture, may be averted by the use of a simple apparatus devised by Lorenz, of Wisconsin. A light padded stick placed beneath the knees, and attached by means of light straps to canvas bands crossing the shoulder and beneath the arm-pit, and drawn close, will secure the flexion desired and prevent sudden extension.

Objections to the use of lumbar puncture are the possibility of: (a) sudden death; (b) infection; (c) the breaking of a needle, previously noted; (d) friends of patient attributing paralysis to puncture.

Hansen of Christiana has recently collected reports of thirty deaths following lumbar puncture. As lumbar puncture has been in quite general use since the introduction of spinal anesthesia in 1899, the total percentage of fatalities must be very low.

The danger from infection might increase with repeated punctures with a less careful surgical technic.

The patient's friends should be notified before the procedure that paralysis is looked for, which the puncture may avert; they will otherwise, if ignorant, almost certainly attribute the paralysis to the treatment.

*Outline for Serum Examination.* Du Bois.

Number of c.c. of spinal fluid.		
Clear.	Cloudy.	Fibrin.
Cytology.		
Bacteriology.	Spread.	Culture.
Globulin.	(Butyric acid test.)	
Albumen.	(Nitric acid test.)	
Clinical diagnosis.		
Animal inoculation.		

Shidler of Nebraska reports that in two cases of the neuritic type unrelieved by large doses of opiates, the pain was lessened by lumbar puncture.

*Serological Treatment.*—The serum treatment of poliomyelitis is still in the experimental stage. Drs. Anderson and Frost demonstrated a serological neutralization test of much value in the determination of cases of the arrested (abortive) type. Serological immunization of monkeys offers hope that human immunity may yet be artificially obtained. There is at present no antitoxin for poliomyelitis.

*Diet.*—The diet should be restricted, nutritious and easily digestible. All fruits should be cooked, and no seeded berries, etc., given to clog and irritate a paretic digestive tube. During the fever stage a child will take ices and iced drinks freely. Fruit juices and ices should be left pleasantly acid. Lemonade, orangeade, pineapple juice, and the same ices are acceptable.

If the patient is not fond of milk, it may be rendered very attractive when served as one of many cream soups or broths.

Corn soup, which consists of milk heated with canned corn, strained and seasoned, is a dish that many children who dislike milk will take eagerly. Croutons or educator crackers add to the nutritive values. Fresh chicken broth, with or without the addition of rich milk, served with soda crackers, or toast, provides a dish easily swallowed by the strained little sufferer.

Oyster soup, clam broth, and where it can be obtained, coquina broth, are among the more appetizing and nutritive dishes.

All of the cooked breakfast foods may be used as such, or slightly sweetened, molded and served cold with cream. Rice is often an acceptable food.

In paralysis of the pharyngeal muscles it may be necessary to resort to stomach feeding. Regurgitation of liquids through the nose indicates some beginning paresis.

Information is requested concerning the following points relating to acute cases of epidemic poliomyelitis during the season of 1912:

1. Contact of cases with old case of poliomyelitis.
2. Contact with sick animals.
3. Antecedent insect bites.
4. Coincident presence of bedbugs.

Kindly send reports to address given, and greatly oblige,

J. V. V. MANNING, M. D.

151 Lafayette Avenue.

Brooklyn, New York.

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## TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

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### SECTION ON PEDIATRICS.

*Stated Meeting held May 9, 1912.*

DR. WILLIAM SHANNON, *in the Chair.*

### OSTEOGENESIS IMPERFECTA, REPORT OF A CASE WITH THE STUDY OF ITS METABOLISM.

DR. HERMAN SCHWARZ and DR. MURRAY H. BASS presented this communication. They stated that osteogenesis imperfecta was one of the diseases which entered into the symptom-complex known as fetal rickets. In 1883, Lobsetin called attention to cases characterized by fragility of the bones and gave them the name of osteopsathyrosis, showing that there was among them a group which was termed idiopathic for which there was no definite etiological factor such as syphilis, tuberculosis, bone tumor, or trophic neurological conditions. As more cases were examined and described clinically and pathologically osteopsathyrosis and osteogenesis imperfecta were found to be identical conditions. By far the greater number of cases occurred during intrauterine life and were stillborn. Some, however, survived and presented a definite clinical picture. Another group appeared to be normal at birth but later on in childhood suddenly developed a tendency to multiple fractures from very little violence.



Many authors were of the opinion that these cases were congenital but that the process had lain dormant. Heredity seemed to be the only important factor in the etiology, many authors having observed several cases in the same family. It was interesting to note that the disease had been present at birth in one of twins, the other child being perfectly normal; this would tend to show that the actual condition of the mother was not at fault and that the disease was a fetal one. The pathology of the disease had been investigated by Sumits, Lovett and Nichols, Looser, Stilling, Harbitz and Fuchs and others. Macroscopically, the bones showed fractures, the breaks being very numerous in some instances. The bones might be soft and pliable or very brittle, and they might be either normal in length or short and plump, scarcely narrower in the middle than at the ends. The cortex of the bone was extremely thin and in the cases of Michel and H. Müller the entire diaphysis consisted of a firm membranous periosteum filled with a red-brown mass intersected by fine bony spicules. The bones of the skull were characteristic in that they were almost entirely devoid of calcification. The base of the skull was usually ossified, but was thin and friable. The ribs were usually ossified but showed irregularly distributed nodules, representing previous fractures. Microscopically, the bones showed the following: The region between the epiphysis and diaphysis of the long bones showed normal relations in respect to the proliferation of the cartilage, the form, structure and arrangement of the cells. Endochondral ossification *per se* proceeded normally but was markedly reduced in amount. In the diaphysis one met with numerous thin, cartilage remnants, but with very few bone trabeculæ. Periosteal ossification was entirely absent in certain places, in others it was slight. The periosteum was thin and the number of osteoblasts everywhere diminished; in the long bones the marrow was markedly increased. The children who survived with this condition were small, underweight, had long silky hair, open fontanels and sutures, small face, soft, delicate skin, protuberant abdomen without any evidence of umbilical hernia and diastasis recti. The extremities showed all sorts of deformities due to fractures, bending, marked shortening and curvature being the rule. The fracture seemed to cause very little pain and union took place rapidly. The x-ray appearance of the bones showed large medullary cavities with very thin atrophic cortex, epiphyseal lines showing up fairly sharply. The prognosis of the disease was bad. In cases occurring late in childhood it was better, as some seemed to undergo spontaneous cure. Drugs and organotherapy had proved equally useless. The case reported was that of a seven months old child of Russian parentage with a family history negative as to syphilis, tuberculosis or any bone disease similar to this one. Another child three years of age was perfectly normal. When the child was four days old a physician found a fracture of the right thigh, but the mother knew of no other

fractures. Except for underdevelopment and the presence of deformities the child seemed normal. The child was breast-fed for five months and then received both breast and cow's milk, but gained very little weight. The child weighed 7 pounds and 4 ounces and was unable to hold up its head which seemed abnormally large in comparison with the trunk which was short and broad. The extremities were small, shortened, curved and angulated. The head was asymmetrical, the left side being flattened. The circumference was 42.5 cm.; the circumference from mastoid to mastoid, 35.5 cm.; occipitofrontal circumference 29.75 cm.; anterior fontanel 8 cm. by 7 cm.; posterior fontanel, 10 cm. by 6.5 cm. The sagittal suture was wide open. There was distinct exophthalmos. The nostrils were fine and delicate, the mouth small, lips thin but no teeth present. The tongue protruded slightly. The hair was long and silky. The chest circumference was 31 cm. The clavicles showed angular deformity. Lymph nodes the size of a pea were just palpable in the axilla and groin. The urine was clear, amber, acid and showed no albumin or sugar. The blood showed hemoglobin 60 per cent.; red blood cells, 4,512,000; white blood cells, 11,600; differential polynuclear leukocytes, 15 1/2 per cent.; large mononuclears, 17 per cent.; small leukocytes 64 per cent.; eosinophiles, 2 1/2 per cent. Basophiles, 1/2 per cent. The noguchi modification of the Wassermann reaction was negative. The child was placed in the Hoobler metabolism bed for six days and during this time was fed on mixed human milk obtained from the outdoor maternity. The weight of the child at the beginning of the experiment was 3400 grams; at the completion 3430 grams. An analysis of the mother's milk showed that it was not at fault. During the six days the child took 3390 c.c. of milk and there was no vomiting and the temperature was normal. There was one stool a day, normal in appearance and consistency. The urine varied from 158 to 250 c.c. a day; the specific gravity from 1005 to 1010. The tables showed that nitrogen metabolism was approximately normal. The child had an absolute retention of 423 mg. a day, 35 per cent. of the intake. This corresponded to the normal child of three or four months. During the day on which the child's urine was collected for creatin and creatinine determination there was an intake of 1.18 grams nitrogen and 370 c.c. of urine was excreted. About 3 mg. per kilo of creatinine nitrogen was excreted in twenty-four hours. This was low as compared to the findings of Amberg and Morrell of from 6 to 9 mg. per kilo weight. The fat retention and absorption were perfectly normal. The calcium metabolism was of particular interest in the light of the disturbance in the ossification of bone. It was seen from the table that the child was retaining calcium to the extent of 45.7 per cent. of the intake. The truest view as to calcium retention was obtained when the retention was based, not on the per cent. of intake but on the absolute

amount retained. A comparison of this baby with others showed that a retention of 109 mg. did not appear to be very low, the average figures being from 110 to 120 mg. The positive calcium balance in this case might be construed in different ways. First, the disease might be considered at an end, especially as there had been no fractures since birth, and the calcium metabolism might be looked at as that of a normal child. But against this was the fact that the cranial bones were so soft and showed such a markedly diminished power of ossification. Second, the disease might be in the stage of repair and this would seem likely since there had been no fractures since birth. But if the body was trying to replace lost calcium there should have been a decidedly greater retention of calcium than was present in the normal child. This was not the case. On the other hand, it might be argued that the calcium balance might remain positive, the calcium being deposited in other tissues than the skeleton. When one considered how complicated the whole calcium metabolism was, such a case as the one under discussion leads one to speculate as to whether there was a distinct relationship between calcium retention and skeleton ossification. The retention of magnesium was 51 per cent. which showed very little variation from Blauberg's case. The phosphorus metabolism was practically normal. The sodium and potassium were both positive, but a discussion of their significance was impossible in view of the small number of existing analyses in normal infants. For the same reason the sulphur balance could not be adequately discussed.

#### SCLERODERMA IN AN INFANT.

DR. ROGER H. DENNETT reported this case. The child was born on October 8, 1911, and weighed 6 pounds at birth. She was the first child of healthy parents. The baby was so far as could be ascertained, perfectly normal at the time of birth but when three days old became very ill with high temperature and rapid respirations. Her life was despaired of and in the course of a week the physician said to the mother that it would be just as well if she did not live as she was not a normal child and all her joints were stiff. She recovered, however, and began to gain in weight. She had a great deal of difficulty in nursing evidently due to inability to swallow, gagging and choking during nursing and often vomiting all that she had taken. At the end of two months she still had the rigidity all over the body and thickening of the skin and subcutaneous tissues. She was then seen by a physician who made a diagnosis of arthritis due to syphilis. X-ray plates were taken which showed lack of ossification in the carpal and tarsal bones. She was then put upon mercurial inunctions for one month and did very badly, losing weight, vomiting a great deal and having many loose evacuations daily. This was interesting in view of the fact that some authorities stated that scleroderma was aggravated by mercury. When Dr.



Dennett first saw her, at the age of three months, she weighed 7 pounds and 12 ounces, seemed normal mentally, but the skin over her entire body with a few exceptions, was yellow, waxy in appearance, perfectly smooth, soft, moist, thickened and indurated, not pitting on pressure. The fontanelle was normal in size and the head well-shaped with no thickening about the scalp. The eyes were deep set and the muscles of the face were partly immobile. The arms were normal, the hands having a small amount of thickening upon the dorsal aspect; the fingers were held more or less flexed, much like congenital club-hand. The chest presented only slight thickening of the skin. The skin and subcutaneous tissue of the abdomen was markedly thickened and indurated with a depression along the median line. The back was also markedly thickened, including the buttocks. The legs were held in the flexed position and could not be extended, even with a great deal of force. The thickening and induration involved the whole of the lower extremities. The medicinal treatment was stopped and more frequent nursings given. Later the vomiting was controlled to a certain extent by paregoric. Very energetic massage was given to prevent ankylosis. The subsequent history of the case had not been of very great moment. Three weeks ago he had begun giving thyroid extract and had increased it to two grains a day. This was because no etiology nor treatment had as yet been satisfactory and because the induration seemed to resemble myxedema of thyroid deficiency to some extent. This was not a common condition in infancy; the youngest case found on record was that of a child thirteen months of age. Crocker had seen about seventeen cases of scleroderma, some of them being in children and he stated that children were less apt to go into the atrophic stage which condition was frequently seen in adults after a period of months or years. He also stated that the disease was apt to run a shorter course in children and that, therefore, the prognosis was better. Scleroderma should not be confused with sclerema, the latter running a subnormal temperature and the indurated areas being of a bluish color, cold and clammy to the touch.

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## TRANSACTIONS OF THE AMERICAN PEDIATRIC SOCIETY.

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*(Continued from July.)*

### THE DEXTRINS AND MALTOSE IN INFANT FEEDING.

DR. THOMAS S. SOUTHWORTH of New York said that during the course of pediatric research into the physiological relations to the organism of the various elements of an infant's food, attention had recently converged upon the part played by the carbohy-



drates, both as destructive and constructive agencies. The importance of the carbohydrates in furnishing to the normal body fuel for energy and heat required no recapitulation; it was rather the injurious effects upon the human body that most keenly gripped their attention. In health the infant seemed to take with about equal facility the three sugars most commonly employed in making up the deficiency of carbohydrates in diluted cow's milk, namely, milk sugar, cane sugar, and so-called malt sugar, but it had remained for recent investigators of the pathology of nutrition to assign to each of these forms of sugar its relative position as a disturbing factor. Although the advantages of the so-called malt sugar, or maltose, have again received wide recognition for purposes of restoring deficient or halting nutrition in infants, and for furnishing sufficient calories during recovery from food injuries, there had been little appreciation of the rationale of its action. The terms malt sugar and maltose were inaccurate and misleading. While pure maltose was a rare product of the laboratory, too expensive for general use, and consequently never employed in infant feeding, the commercial products to which this generic name was too often loosely applied, were numerous and it was doubtful whether any two of them had exactly the same composition. The term embraced almost any preparation produced by the action of diastatic ferments upon starch. While lactose and saccharose were given in the food by themselves, maltose was never administered without an admixture of dextrins, which latter, while capable of being further elaborated into maltose, and subsequently into dextrose, had, for the time being, very different chemical and physical properties. This association of the dextrins with maltose, instead of being a negligible matter, was a factor of considerable importance and might be assumed to play a large part in the favorable effects of the malt preparations in disturbed conditions. Although malt preparations were spoken of as less fermentable than the other sugars, it was, of course, an error to think of maltose itself as not liable to fermentation of certain types, since this property of maltose was relied upon in all brewing operations. Dextrin remained unfermentable in beer, was immune to fermentation in the intestine until reduced to assimilable maltose. After demonstrating that the presence of dextrins played no small part in the therapeutic and nutritive values of maltose-dextrin preparations, their attention was directed to the proportion in which they were present in the commercial products. An exceedingly interesting field of research was now open for determining the nutritive and therapeutic values in normal and pathologic cases of high, average, or low percentages of dextrin in maltose-dextrin mixtures.

#### MALTOSE IN INFANT FEEDING.

DR. JOHN LOVETT MORSE of Boston said that three different sugars were used commonly in the feeding of infants, lactose,

saccharose and maltose. Maltose was seldom, if ever, used in the pure form. Almost all of the sugars which were spoken of as malt sugars were in reality combinations of maltose and dextrin. These sugars were all disaccharides, lactose being a combination of dextrose and galactose, saccharose of dextrose and levulose and maltose of dextrose and dextrose. The dextrans were bodies which were formed in the change from starch to maltose, and there was a great variety of them and their exact composition was not well known. The dextrans being finally converted to maltose, their ultimate end was dextrose. The disaccharides were not absorbed as such from the intestine under normal conditions but were first broken down into their respective monosaccharides by special ferments, maltase, saccharase (invertin) and lactase. These were formed in the mucous membrane of the small intestine. Maltose was the most quickly absorbed of the three disaccharides and saccharose next. The disaccharides were all fermentable. It was generally accepted that under normal condition, and when not given in excess, lactose and maltose had a slightly laxative, and saccharose a slightly constipating effect. According to Kendall, the normal fecal flora of the breast-fed infant was comprised of the following organisms: *B. bifidus*, *Mic. ovalis*, *B. coli*, *Bact. aerogenes* and *B. acidophilus*, and the composition and maintenance of the normal fecal flora was without question due to the relative excess of carbohydrate, in the form of lactose, in the milk. It was, therefore, of considerable importance, in order to maintain the normal fecal flora, to have a considerable amount of sugar in the food of babies fed on mixtures of cows' milk. According to Kendall, lactose favored especially the development of *B. bifidus*, which was normally the predominant organism in the large intestine, while maltose was especially conducive to the growth of the *B. acidophilus* which, although normally present in small numbers, if present in large numbers was liable to produce an excessive degree of acidity which might cause irritation of the intestine and an intolerance for sugar. Under normal conditions, therefore, as far as regarded the maintenance of the normal intestinal flora, lactose was preferable to maltose. The more rapid immediate gain in weight when maltose was added to the food poor in sugar than when lactose was added was of no importance, since the gain in both instances was almost entirely due to the retention of water.

Finkelstein and Meyer developed a food to which they gave the name "Eiweiss-milch" which was prepared with precipitated casein and buttermilk, after which it was boiled; its composition was fats, 2.5 per cent.; lactose, 1.5 per cent.; proteid, 3.0 per cent.; and salts, 0.5 per cent. They claimed that with this mixture the loose, green stools were quickly replaced by typical soap stools. One quart of milk contained, however, only about 370 calories and babies taking it suffered from lack of nourishment. They advocated, therefore, the addition of malt sugar of the dex-

trin-maltose preparations to the mixture after the disappearance of the acute symptoms in order to avoid loss of weight and disturbance of nutrition. The use of this method of treatment during the past year had convinced him that there was a variety of intestinal indigestion in infancy which was relieved by reducing the sugar and salts in the food to the minimum and giving large amounts of casein and that the dextrin-maltose preparations could be given to these patients sooner than lactose without causing a return of the symptoms. This type was characterized by an increased number of stools of diminished consistency, green in color, often frothy, acid in reaction and not infrequently containing mucus and fat curds.

In conclusion Dr. Morse said that lactose was for many reasons preferable to maltose for the feeding of normal infants. There was a type of intestinal indigestion due to the fermentation of sugar in the treatment of the convalescent stage of which maltose was better borne than lactose. Maltose was contraindicated in the treatment of diarrheas due to the gas bacillus and similar organisms and was less useful than lactose in the treatment of those caused by the dysentery bacillus.

#### DISCUSSION.

DR. JOHN HOWLAND of St. Louis said that more work should be done on the dextrins. They had been told that feeding infants with pure dextrin and with no maltose was not good; they had also been told that ten babies thus fed by Keller died as the result, and, therefore, pure dextrin had not been used. With regard to the use of lactose in normal children, the Germans looked upon this as being dangerous and they gave as an argument their experiments upon puppies. However, the puppies that had rickets did well on this feeding; if they were fed on glucose and maltose they did badly. If they were fed upon saccharose alone they died. Dr. Howland did not agree that the use of lactose was dangerous in dysentery. Lactose in large quantities would undoubtedly increase the diarrhea and this danger should be born in mind. The experimental reports showing lactose to be a useful form of treatment must be accepted.

DR. ISAAC ABT of Chicago said that he had been using the malt preparations for some time and normal children did very well so far as gain in weight was concerned. He thought it was well known that all the preparations belonging to the malt-dextrin group would cause constipation, and therefore it was necessary to add some substance to overcome this tendency. When combined with lactose there was less trouble from constipation. Dr. Abt said the whole subject of the bacteriology of the intestinal tract remained as yet in an indefinite state. Valuable work had been done but they could not as yet base any conclusion on it, much less could they prescribe sugars on the basis of the intestinal flora. Too much importance was being given to the sugars alone and it seemed to him that the normal child did equally



well on malt sugar, cane sugar, and sugar of milk. He had watched babies both in dispensary and in private practice on the different sugars and they showed no difference whatever in their progress.

DR. ROWLAND G. FREEMAN of New York said he thought the warning about the use of malt sugar was timely. All babies should have a chance at normal feeding before given the abnormal. There was a tendency to place children on these malt foods because they grew faster. In an investigation regarding scurvy, it was found that in many cases the proprietary foods were given and that six per cent. of cases of scurvy were fed on these foods. The cases of scurvy that he himself had seen were fed on malt foods. If the babies did not do well on lactose then change to maltose.

DR. L. EMMETT HOLT of New York spoke of the relation of maltose to scurvy and said that it was a fact that children fed on maltose did develop scurvy. The use of maltose would overcome the constipation from which so many children suffered and in his opinion the liquid preparations were better than the dried ones. In a study on the intolerance of certain sugars made last year it was found that lactose in solution was practically sterile and so was cane sugar, but maltose preparations contained many organisms that were quite pathogenic. These organisms were killed only by quite a high temperature (the boiling-point for twenty minutes.) That temperature would, of course, change the composition of the sugar. They had as yet much to learn about the variations in sugars and their use in abnormal cases. The use of cane sugar in diarrheal diseases was a great advantage where both malt sugar and maltose were badly tolerated. That was the secret of success in the use of ordinary condensed milk. Dr. Holt said that in the main he agreed with the conclusions drawn.

DR. L. E. LA FETRA of New York had decided that the use of milk sugar did harm, especially in certain cases. There was no doubt but that those cases of diarrhea occurring among hospital patients would improve when milk sugar had substituted for it either cane sugar one of the dextrin-malt preparations, or the amount of milk was lessened. During the past ten months he had been using not only cane sugar but the dextrin-malt preparations as well, and had obtained better results. In many cases of diarrhea they obtained the best results by diminishing the amount of sugar of milk. In cases with thin acid stools or a large amount of mucus and blood, it was a mistake to resume the use of sugar of milk early; the babies should be kept off of it for quite a while.

DR. HENRY L. COIT of Newark, N. J., said he believed there was a chemical as well as a gross difference due to contamination between mother's sugar of milk and the commercial sugar of milk and for that reason he had tried to get at the trusts who were marketing the sugar of milk. After a great deal of difficulty he had obtained an audience with the chemist



of the trust and he admitted the presence of bacterial toxins but stated that their milk sugar answered the requirements of the pharmacopœia. Professor Leeds had made an investigation and had found that milk sugar was full of bacteria and also of chemical impurities. One should never use more than 1 ounce and this should be boiled as the commercial article is not reliable. The brand of milk sugar known as "XXX" was the finest. It occurred in octahydra crystals. It was prepared by redissolving, filtering and boiling down into crystals.

DR. J. P. CROZER GRIFFITH of Philadelphia said he wished to call attention to the fact that he was a member of the committee appointed to study scurvy and that their report had shown that a large number of cases of scurvy were caused by the use of malt preparations.

DR. ALFRED HAND, JR., of Philadelphia said that while he had never conducted a scientific investigation on the influence of sugar in infant feeding, he always felt that lactose tended to produce diarrhea. In private practice where milk sugar was used so much there was a tendency to constipation; this was on account of the diuretic effect. There was more trouble with constipation in private practice than with babies in hospital wards. Where a child was obstinately constipated lactose or saccharose had a tendency to regulate the bowels.

DR. THOMAS S. SOUTHWORTH of New York said that Dr. Morse had spoken of the disadvantages of the use of starch, and he himself had long maintained that starch could be overused in children and one should be very careful as to the amount used, especially of the various diluents. He had used barley water largely during the last decade in children who were not doing particularly well on other diluents. The death of those children fed on dextrin did not mean by any means that death was due to the dextrin. The malt dextrin mixtures contained an amount of dextrin to which little attention had been paid in the literature until recently. Dr. Southworth expressed himself as much interested in what Dr. Abt had said regarding the use of malt dextrin mixtures and his statement that they were constipating rather than laxative in their effect corresponded with his own experience. This was probably due to the extraction of fluid from the tissues. Dr. Southworth said he had written for figures regarding the preparations and had received only a very curt reply.

DR. JOHN LOVETT MORSE of Boston said that his object in looking into maltose in infant feeding was to find out what basis there was primarily for the wave of this feeding which had gone over foreign countries, then started in the Middle West of the United States and was gradually working its way east. He could not see a single reason for the use of malt sugar. There were men who wrote favoring malt sugars who stated that the milk sugar of cow's milk was not similar chemically to the milk sugar of mother's milk. There was no chemical basis for

such a statement; chemically, they were the same. In regard to Dr. Coit's statement that the milk sugar should be boiled, he thought that the boiling did not destroy the toxic products although it probably did destroy the bacteria. He did not think that this should be used as an argument against its use. Dr. Morse also recalled the fact that the American Pediatric Society had made an investigation in regard to scurvy and there must be something the matter with that report because some had quoted from it showing that certain cases of scurvy had been caused by certain articles of food and others reported that it had stated that scurvy was not caused by these certain articles of food. In Boston during the past two years Dr. Kendall had been working in the Floating Hospital on the bacteria that appeared in acute diarrhea diseases occurring among babies during the summer months. Dr. Kendall had a great deal to offer the profession, and he, himself, as well as others, were willing to follow Dr. Kendall's lead. During the summer of 1910 they employed this treatment, giving the babies a solution of maltose and the entire staff felt that no harm had resulted from the employment of this sugar. Just as good results could be obtained in any city where these diarrheal diseases appeared. Too much reliance could not be placed on the percentage of recoveries as, at times, many of the cases were of a mild type.

#### SERUM TREATMENT OF PNEUMONIA.

DR. ROLAND G. FREEMAN of New York presented this communication. Of the three treatments that were based on laboratory investigation one might mention the use of leukocyte extracts advocated by Hiss, the use of vaccines either commercial or autogenous, and finally the use of serum. On account of the usually favorable results of treatment with antipneumococcus serum it seemed worth while to try it in a series of cases, using alternate cases as controls. The cases admitted to this series were those showing a fairly high temperature with good signs in the chest. In none of the cases was there any evidence of irritation at the point of injection. The serum was rapidly absorbed and there was no inflammatory disturbance. In all of the cases, on the other hand, the injections were followed by urticaria, but without fever or general disturbance. The average age of the children injected was twenty months, and of the controls was eleven months. As to the effect of the serum there was in many cases an immediate change in the appearance of the child. Children that looked septic, were apathetic, with anorexia and a pale blotchy complexion, in several cases after the injection had a good color, were brighter, took the feedings better and seemed much improved although the condition in the lung was usually unchanged or perhaps spreading. He concluded that the serum injections while apparently affecting favorably the course of the disease in some cases,

appeared to have no result in others; that in most cases there appeared to be a better reaction on the part of the child after injection than before. It was usually followed by some reduction in leukocytosis and the percentage of the polynuclear leukocytes increased. In these favorably influenced cases there was little spreading of the disease after injection, and in some a fairly rapid resolution. The pneumococcus serum presented a safe method of attempting to influence the course of pneumonia in children; the addition of antistreptococcus serum seemed to offer no advantage over the use of the pneumococcus serum alone.

DR. MATTHIAS NICOLL, JR., of New York said that he had had a fairly large experience with the use of the pneumococcus serum in the treatment of pneumonia both in children and in adults, and he thought that the conclusions that Dr. Freeman had come to were those that all must arrive at who had had any experience with its use: Namely, a verdict of "not proven." Sometimes good results were obtained and sometimes no results whatever. Dr. Freeman used full doses of the serum. There was no use in giving such doses as 10 or 15 c.c., but at least 100 c.c. and personally he believed in giving it in the veins.

Dr. Nicoll said that he had recently been made somewhat skeptical in regard to the value of the serum by an attempt which he had made to immunize diphtheria cases against secondary pneumonia. The number of children was between forty and fifty, of two years and a half of age or under, and at the time of their admission to the hospital were free from pneumonia as far as could be judged by temperature, pulse and respiration. All these children were intubated either before admission or shortly after so that the reliability of physical signs in the chest was not great. These children were each given 20 c.c. of a mixture of one-half pneumococcus serum and antistreptococcus serum. By comparing the death rate from pneumonia in this series of cases, it was found that the results were not remarkably better than that which had been obtained in each of the two previous years, and during the same seasons of the year among the same class of cases not immunized. It was difficult therefore to have a great deal of faith in the curative value of a serum which had so little apparent protective power against the organism whose activities it was designed to control. In the last series of cases reported from Germany the serum had been given intravenously in what dosage it was not possible to determine, as the method of standardization was not stated and the dosage was regulated according to the latter, with results by no means convincing of its curative value. In view of the fact that not infrequently good results seem to follow the use of the serum he believed that it should be given in prolonged and severe cases of pneumonia which seemed to be daily losing ground, but the dosage should be large. He had not seen any bad results which could be definitely attributed to the use of the serum, even when given intravenously in large doses. Dosage



of 100 c.c. given subcutaneously while it caused a formidable tumor occasioned very little pain and was easily administered.

#### THE EMPLOYMENT OF SALVARSAN IN INFANTS AND YOUNG CHILDREN.

DR. L. E. LA FETRA of New York said that if they considered only the moderate grades of congenital syphilis, the treatment of the disease by the older methods had been quite satisfactory; but when they considered the severe types, they experienced a feeling of dissatisfaction. On account of the high mortality of the serious cases, on account of the possibility of late manifestations of the diseases of the eye, ear, bones or nervous system, there had long been needed some more powerful and more certain remedy. The use of salvarsan in adults had been general during the past two years and very definite conclusions had been reached in regard to technic and dosage; in infants, however, there was not the same certainty as regards technic and dosage. Salvarsan might be given to the infant indirectly by injection of the pregnant or nursing mother, or it might be given directly to the infant. The results on the infant of injecting the pregnant woman with salvarsan had been generally unfavorable. The best and most rapid results were obtained by the direct injection of salvarsan into the infant. The routes for injection have been subcutaneous, intramuscular and the intravenous. The subcutaneous method produced bad sloughs or cellulitis and had to be abandoned. Since June 30, 1911, there had been treated at Dr. La Fetra's service in the Children's Wards at Bellevue Hospital twenty-five cases of hereditary syphilis of the congenital type. Of these, ten received salvarsan either with or without mercurial treatment, while fifteen were treated by the use of mercurials alone. Many did not receive the salvarsan treatment because they were in a moribund state and died soon after entering the hospital; others did not receive it because the condition was so mild that it seemed wise only to use mercury. The ages of the fifteen patients in whom only mercury was used ranged from three weeks to one year, most of the patients about three months old. The ages of the ten salvarsan cases ranged from two months to five and one-half years. The results of the fifteen cases treated by mercurials alone were as follows: Three improved, two unimproved and ten died. The ten cases treated by salvarsan showed a mortality of only two; all the other cases were decidedly improved and showed a marked gain in weight and improvement in general condition in addition to the disappearance of their specific symptoms.

Dr. La Fetra concluded that (1) while the indirect method of giving salvarsan to the nursing mother was valuable and should be used when the mother was available, the surest method consisted in giving salvarsan to the infant. Both indirect and direct administration should be employed whenever possible. (2) The



intravenous method of administration was the best. Usually it would be found easiest to expose the vein before attempting to insert the needle. (3) The dosage should not be less than 0.01 grams per kilo. (4) Repeated injections and supplemental treatment by mercurials might be necessary. (5) The Wassermann reaction should be followed for a year.

DR. BUTTERWORTH of New Orleans said that only those who had tried to enter the veins of the upper extremities realized the difficulties encountered and he advised the use of the vein over the internal malleolus. From his experience with a large number of cases he believed that the repeated injection of small doses of salvarsan was better than the giving of the larger doses. The simplicity of the apparatus presented, commended itself to him.

DR. FRITZ B. TALBOT of Boston said that the location of the injection of salvarsan had caused many people trouble. From the experience of Dr. Vincent of Boston it would seem that injections into the jugular vein were the most practical of all. In the cases which were under his observation no trouble followed when the injection was made into this vein.

DR. ISAAC ABT of Chicago asked how old the children were.

DR. L. E. LA FETRA replied that the ages ranged from six weeks to two years, one child was five and one-half years of age. The apparatus he had shown commended itself to him because with it it was possible to give several injections at the same time. The use of the glass tube was undoubtedly a great advantage because the fluid could flow through with greater facility and no pressure was necessary. As before stated it was better to use salvarsan in connection with mercury.

#### THE INFLUENCE OF MILK STATIONS ON INFANT MORTALITY.

DR. SAMUEL S. ADAMS of Washington, D. C., said that milk stations for the distribution of modified milk to the babies of the poor had been established and maintained by Mr. George M. Oyster, Jr., during the past year. Sixteen physicians had cooperated in the work at the various stations. From two to four graduate nurses had been employed during the entire year and their whole time and attention had been given to the work. Six hundred and thirty-one babies had been prescribed for. Four hundred and seven cases had been terminated and 224 cases were in the stations on April 24. Of the 631 cases 434 had received milk as prescribed by physicians absolutely without cost, 197 cases had, during all or part of the time they were in the stations, paid for all or a part of the milk furnished. About 322,400 bottles of milk had been furnished during the year. Of the total number of cases 213 or 34 per cent. of all cases were white, while 418 cases or 66 per cent. of all cases were colored. The total number of cases lost from all causes was twenty-nine. In addition to ordering and dispensing the milk at the various stations, the nurses had visited and investigated conditions in every home where the milk had been used. They also had given much personal instructions and suggestions

as the needs of the individual cases seemed to suggest. In all about 6500 such visits had been made by the nurses during the year. Believing that both education and good food were essentials for the reduction of infant mortality a course of sixty lectures was organized for the benefit of those desiring general information regarding the care and feeding of babies. The average attendance at all lectures was 31.7, and the total attendance 2034. Twenty cash prizes were offered by Mr. Oyster in connection with the lecture course. Ten of these prizes were to be given young people between the ages of twelve and sixteen for the best essays covering the work of eight or more lectures. Ten other prizes were given for prompt attendance and good behavior. Twelve physicians and others cooperated at these educational meetings as lecturers on some one or more phases of the work. Ice was also furnished during the summer months. As the result of this campaign of education of supplying good food and ice, the mortality among those availing themselves of Mr. Oyster's beneficence was markedly reduced and was very low when contrasted with the mortality among infants in the District of Columbia.

#### DISCUSSION.

DR. ROWLAND G. FREEMAN of New York said there was undoubtedly a great reduction in infant mortality after the establishment of these milk stations. This reduction could not be accomplished by education alone. In certain communities in France where milk depots were established there had been a reduction of as much as 60 per cent. in the infant mortality. Several years ago in New York the death rate as a whole increased slightly while in one district where there were visiting nurses it had decreased 15 per cent. Assuming that with thorough educational work and house to house visits they could get 15 per cent. difference in the death rate while in France they could by means of milk stations get a difference of 60 per cent., 45 per cent. of the reduction would be attributable to good milk.

DR. J. H. MASON KNOX, Jr., of Baltimore said that the statistics given by Dr. Adams corresponded to the ones in Baltimore. There was one feature of the work that had not been given the prominence that it deserved, and that was the prenatal visits to the expectant mothers. As a rule babies were not brought to them until their condition was desperate and, therefore, they had endeavored to get in touch with the obstetric clinics. At the Hopkins Clinic during one year they had 500 babies and mothers and the mortality was only 5 per cent. Fifty per cent. of these were colored people. Forty per cent. of the children were illegitimate and 60 per cent. of them were exclusively breast-fed; this was due to prenatal instruction. This educational work in a way combatted the midwife question. As pediatricians they should encourage better obstetrics.

DR. HENRY L. COIT of Newark, N. J., emphasized the point that the nurse employed in this work should be one who was trained, one with good education, good judgement and experience in handling the young. Dr. Coit said he had such a nurse working under him in Newark and he also had a statician furnished him by the Russell Sage Foundation. As the result of her work among 515 babies they had obtained a mortality of only 2.7 per cent. He agreed with Dr. Freeman that it would be unfortunate to swing toward education alone rather than the dispensing of milk; the two should be used jointly. The value of education, however, was unquestioned.

DR. SAMUEL S. ADAMS of Washington, D. C., in closing the discussion, said that one of the first things was to educate the people as to how to care for the milk. In Washington they had a very refined equipment, comparable to the milk supplied by the Walker-Gordon people. When a doctor applied for work in these stations he always asked him if he knew how to treat babies by modern methods. If he did not he would not be employed. Patent foods were barred; if the doctors wished they might give cereals in combination. Some of the doctors preferred raw and some pasteurized milk. Dr. Adams thought that the question of prenatal visits belonged to the field of obstetrics. Dr. Adams said they were careful in the selection of nurses and took those preferably who had been trained in such hospitals as he himself was connected with. He laid emphasis on the necessity of the nurses being firm in their dealings with the people at the stations and in their homes. He also emphasized the importance of having attractive nurses as these impressed the parents. The general infant mortality in Washington last year was high.

#### A SPECIMEN AND RADIOGRAMS OF A CASE OF CHONDRODYSSTROPHY.

DR. L. E. LA FETRA of New York reported this case and presented specimens and radiograms. The child was admitted when one-half a day old on November 1, 1911, and died January 10, 1912. The autopsy record by Dr. Charles Norris gave the anatomical diagnosis of chondrodystrophia congenitalis and rachitis. The body of the female child was 42 cm. long and weighed 2270 grams. The anterior fontanel was 5 cm. wide and 6 cm. long. The sutures were wide open. There was a marked rachitic rosary, the swelling being most marked on the inside of the thorax. There was no Harrison's groove, but a longitudinal groove just external to the costochondral junction. The xiphoid cartilage was bifurcated. The left lung was atelectatic. The heart lay to the right, the aorta being visible and to the right of the pulmonary arteries. There was a small patent foramen ovale. The thyroid gland was small. The foramen magnum was very narrow and the clivus was steep.

The radiographic examination of the whole body was taken by Dr. Hirsch and showed all the essential bony and joint changes characteristic of achondroplasia. There were no points of ossification for the epiphyses of any of the bones of the upper



extremity; but the lower epiphyses of the femora were partially ossified. The diaphyseal ends of the bones were broadened and sharply outlined.

#### ELECTION OF OFFICERS.

*President*, Dr. John Lovett Morse of Boston; *Vice-President*, Dr. John Ruhräh of Baltimore; *Secretary*, Dr. Samuel S. Adams of Washington, D. C.; *Treasurer*, Dr. Chas. Hunter Dunn of Boston, Mass.; *Recorder and Editor*, Dr. L. E. La Fetra of New York; *Representative of the American Pediatric Society, Committee on Arrangements for the Meeting of the Congress in Washington, D. C. in 1913*, Dr. Samuel S. Adams of Washington, D. C. Next Place of Meeting, Washington, D. C.

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## MEETING OF THE AMERICAN MEDICAL ASSOCIATION AT ATLANTIC CITY.

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*June 4-7, 1912.*

#### SECTION ON DISEASES OF CHILDREN.

DR. ISAAC A. ABT, *Chicago, in the Chair.*

#### *Afternoon Session, June 4.*

THE CHAIRMAN'S ADDRESS, prefaced by an historic résumé of the literature of gastrointestinal diseases, called attention to the necessity for scientific classification. He said that the work already done was excellent, that even as early as the literature of ancient India wet-nursing was a measure commonly employed, and that almost modern seemed the advice of Soronos, and cautioned against complication and duplication by publication of other works upon gastrointestinal disorders without sufficient reference to those already published. He thought that the work of the early nineteenth century in the extension of the knowledge of pathology and the classification of bacteriology had done a great deal through dividing the functions of the organs and the diseases associated with pathological lesions. He said that during this period diarrhea was first divided into its seven great classes and each fully described, the climax being reached by Wiederhoefer in 1880. In Jacobi's writings attention was directed to the infectious nature of gastrointestinal diseases, and the fact that the digestibility of food was of as much importance as its nutritive value. He thought that bacteriological research had been of little value as an aid in the scientific classification of the disease, having been vague and inefficient for a long time, identical pathologic lesions being associated with inconsistent and different courses of the disease, and the descrip-



tive terms used in a confusing way. One group of intestinal disorders being dependent upon a bacteriologic cause, he thought it was necessary to divide them from the group that have no such origin. He also stated that the gastrointestinal diseases of infants should be divided from those of older children; but cautioned against the tendency to drift too rapidly into these advanced ideas. He said that in order to appreciate the need for research work in the etiology of gastrointestinal disease, investigation of foods, the processes of digestion in normal and disturbed states, and constant retrospective study should be made that work already done might not be duplicated; and inventory taken of the contributions of modern times so that the condition might be understood to a degree which would enable pathologists to meet it with any certainty of results.

*The Ability of Women to Nurse their Children.*—Dr. J. P. CROZER GRIFFITH of Philadelphia gave statistics to show the importance of breast feeding as compared to artificial feeding, and the influence of the latter upon the death rate, and the subsequent health of children. He said that he knew of men who claimed to be able to feed artificially as well as at the breast, but he was not so optimistic. He had sent a circular letter and questionnaire to his patients and those at the clinic from the replies to which he gathered that the chances for robust life, and recovery from disease, were five times greater among breast-fed infants. He said that frequent examination into the diseases of adult life would trace their causative factors to artificial feeding in infancy. He thought that physicians were largely responsible for the increasing number of artificially fed infants and said that in his studies he had found few women actually unable to nurse their children, as compared with the vast number who had been permitted to feed artificially for some trifling irregularity. Figures gathered in support of artificial feeding, he said, were misleading from the fact that they were largely from lying-in hospitals and could show but a week or ten days of the life of the child and the mother under conditions of care and regularity conducive to progress. He thought under careful management and education fully 60 per cent. of the women outside of maternity hospitals were capable of nursing their infants. His experience showed that infrequency of breast feeding was more prevalent among the better classes than among the poor, but that there was an increasing desire on the part of most women to nurse their children. He thought that actual disability might be transmitted by inheritance, but that most of the inability was disinclination, brought about by generations of teaching that artificial feeding was just as satisfactory, more convenient, and the claims of manufacturers for their foods. Among the poor the necessity for the mother to work to support her children and her inability to get proper, milk-stimulating food were factors which could only be corrected by changed sociologic conditions. He thought that education, and better

attention to nutriment could do a great deal for these objections to breast feeding and that so long as the contraindications for natural feeding were more fancied than real, the cure was largely in the hands of physicians. He said that a breast which at first gave a small, indifferent supply could be stimulated and that there was no good substitute for mother's milk. It was the natural food of the child, proportioned in its ingredients for its digestive ability, and that no pediatricist should advise weaning until repeated, conscientious trials had been made.

*Supplemental Breast Feeding in Infants.*—Dr. H. M. McCLANAHAN of Omaha gave as the indications for supplemental feeding: first, the development of the infant and, secondly, the health and comfort of the mother. He said that there was nothing to successfully take the place of mother's milk, that under normal conditions it was sterile, ingested at a normal temperature, and contained protective chemicals that the child needed. He lamented the fact that no other function of the human body had been studied so little. He said that when the milk was insufficient for the nourishment of the infant, supplemental feeding was indicated, but under all circumstances the mother's milk should be used, and every effort made to increase the quantity. He said that in 400 cases investigated he found only fourteen mothers who refused to nurse their children, while 250 had not done so because physicians had told them their milk was not good and their babies were starving. He thought that infrequent, irregular use of the breasts had a tendency to lessen the secretion and depreciate the quality. From his experience he did not advise the use of the breast pump. In supplemental feeding he advised giving the breast first, then the bottle, so that as the flow increased the child would get the benefit of it and take supplemental food in gradually lessening quantities. He thought it a mistake for a child to "strip" the breast, suggesting ten minutes as an average time for a nursing, but said that no positive rule could be laid down for a condition which varied so greatly as this. He said that where the breast is used a very small amount of prepared food would satisfy the infant and cause it to gain and develop. He thought that the majority of women would nurse their children if they were helped and instructed, and thought that weaning should not be advised from the first or second failure, but that repeated attempts should be made. He said that the responsibility rested upon physicians, that if they would realize the importance of breast feeding they would secure the cooperation of the mothers and that the mortality rate of infants before the second year would be markedly lessened.

DR. D. B. ENGLISH of Summit, N. J., said that where milk was scant he had advised using first one breast and then the other, so that the child would get food enough. He thought that the child should get enough at each nursing, so that the nursings would not have to be frequent. If that was insufficient he gave

bottle milk, but gave it at intervals during the breast nursing, so that it was completely mixed with the mother's milk to aid digestion. He said that where the artificial food was given first the child did not get the benefit of the increase in the mother's milk.

DR. CRAM of Milwaukee thought that scanty milk was often due lack of sleep and said that he frequently advised taking the infant to away from the house at night so that the mother's rest might not be broken.

DR. SOUTHWORTH of New York said that one reason why infants did so much better upon breast milk was because it required almost no supervision. Bottle feedings must be changed and modified from time to time and the indications for a change were want of continued development of the child, and each time this occurred the progress of the infant was interfered with. He, however, did not think that the breast-fed infant should go entirely unsupervised, and thought that a great deal of the failure to nurse successfully was due to mothers being left to their own resources. He agreed with Dr. Griffith that the responsibility was largely with physicians, that their grounds for advising weaning were often inadequate. He did not believe that there was very much "bad" breast milk, there might be insufficient quantity, but he thought as a rule what there was was good, and could be stimulated. He said that in his practice the cases were extremely rare where the mother's milk actually injured the child. He considered examinations of mother's milk misleading. He thought that if the mother's health was built up and she was taught how to increase the supply of milk its quality could usually be relied upon. He said that too little stress was laid upon the great protection to children in breast feeding.

DR. SHAW of Albany said that many a child had been saved from severe illness and probably death by even one breast feeding a day. He said that this was shown clearly in institutions where there is but one wet nurse and each child got but a small quantity. He disagreed with Dr. McClanahan in his statement that the pump did not stimulate the quantity. In his practice it had proven good. He also disagreed with Dr. Southworth's statement that analyses were of no value. He thought them a distinct aid. He said that through analyses he had been able to demonstrate to his satisfaction that the use of the pump increased the amount of proteids.

DR. CHURCHILL of Chicago said that at the Children's Memorial Hospital in Chicago they employed one wet nurse in the winter and two in the summer. He said that the stimulation of the breasts, the hygienic life and the careful, regular diet, markedly increased the amount of milk secreted. He said that for fear of infecting the nurses, they did not feed the children at the breast, but used the pump and then fed from a bottle; in this way they were able to keep accurate records of the amount each nurse gave, and they found that one nurse, for a few weeks,



gave five quarts a day, which would seem to indicate that there was value in a breast pump. He said that even one feeding a day of breast milk would increase the amount of cows' milk a child could take by stimulating digestion.

DR. JOHNSTON of Grand Rapids emphasized the difficulty of getting wet nurses in small towns. He said that during the summer months they were able to find a number of women about the town who were able to spare from a few ounces to a pint of milk a day and in this way they were able to give each of the children in the institution some breast milk. He had obtained statistics in Berlin showing that the mortality among children partly breast and partly artificially fed was but 10 per cent. greater than that of all-breast-fed, while that of the entirely artificially fed was fully twice as great. He cited one group of thirty families, among which were eighty children, that at the end of the eighth year showed death of all of the artificially fed, while all of the breast-fed were living, showing that the ill effects of artificial feeding are felt through all the childhood diseases.

DR. SCOTT of New York said that peasant women fed their children at any time and appeared to have no trouble, and he thought that if the importance of breast feeding was impressed more firmly upon mothers breast feeding would become more universal. He thought the underlying objection partly psychologic, that women had been educated to think that bottle feeding was as well for the child and as it was more convenient for herself, and did not interfere with her social duties, they would not make an adequate effort to feed their children naturally. He said that in his work among the poor he had found when he impressed upon the women the desirability, and the protection, of even one breast feeding a day, they were willing to make the effort. He thought that obstetricians were partly at fault, because, not understanding the problems of feeding, they allowed the child to run down into an emaciated state and then called in a pediatricist to bring them up.

DR. HARRINGTON of Milwaukee thought that the practice of putting the child to first one breast and then to the other was wrong because normally the child nurses from one breast, then in two hours from the other, giving each breast a rest of four hours, while with this practice each breast had a rest of but two hours, and was not a normally strong breast to start with. He thought that better results could be obtained by giving one breast, then the supplemental food, so that each gland will have a proper rest between feedings.

DR. DOUGLAS of Detroit said that every woman could nurse successfully if properly instructed unless there was something organically wrong. He said that successful nursing, however, did not consist merely in getting a certain amount of liquid into a child; that the mother's diet, exercise and rest must be regulated. He said that, having done that, if the child continued to have green, slimy stools, it was safe to say that there was something



wrong, and that persistence in even one feeding a day would injure the child. He said that he was heartily in sympathy with supplemental feeding if the mother's milk was good, but merely scant in quantity, but where it was not, he thought it bad practice to feed it just because the mother had it. He thought that if, after fair trial, the child was not in healthy condition it should be put upon modified milk diet. He thought that obstetricians were responsible for the careless work of midwives and the responsibility they assume in advising women in matters which they do not understand.

DR. DENNY of Brookline, Mass., said that one advantage of supplemental feeding was that children were accustomed to cows' milk early, so that if for any reason weaning was necessary it worked no injury to the child. In supplemental feeding, he said, one began by giving a small amount of a foreign albumen to the infant and it was being immunized against it.

DR. ZAHORSKY of St. Louis thought that the physicians were being too severely condemned for the increasing number of artificially fed infants. He said that there were many conditions about breast feeding that were not understood; that there was a disturbed condition in the infant which caused suffering and for want of more definite knowledge it was attributed to the food, while as a matter of fact physicians did not know what the cause was, and were powerless to relieve it. He called attention to the condition, often seen, of a young, healthy, apparently normal woman who, for some reason or another had no milk, and the physician could not increase it. He said another cause for women not nursing, which had been passed over too lightly, was a disagreeable sensation. He thought that if it could be made a pleasure to her, and its extreme desirability brought home to her forcibly there would be little difficulty in getting most mothers to nurse their babies.

DR. SOUTHWORTH wished to correct the impression which Dr. Shaw got from his remarks that he was opposed to analysis of milk. He was not, but emphasized the point that if every baby was weaned upon the findings of the first analysis a great injustice would be done.

DR. BRADY of St. Louis said that some children had to be weaned because there was too much milk—they were being overfed.

*Long-Interval Feeding of Premature Infants;* read by DR. J. C. LITZENBERG of Minneapolis. He said that short-interval feeding of premature infants, instituted empirically, had been handed down from text-book to text-book, owing, no doubt, to the accepted belief that their caloric needs were proportionately greater than those of mature infants, and that the best way to supply that demand was to feed small quantities of mother's milk frequently. He presented a series of cases (illustrated by charts) from his practice showing that where three, four and even five-hour intervals were employed from the beginning

there was less digestive disturbance, less cyanosis, no greater initial loss, and just as rapid gains and less care and anxiety on the part of attendants, than with short-interval feeding. His charts showed that his cases gained on a very small percentage of body-weight of food, while most authorities recommend one-fifth of the body-weight. He said that these babies could take the required amount without digestive disturbance even if they were fed only every four hours. He made no attempt at establishing an hour schedule for premature infants, but they had had such good results with their series of cases that he considered their findings good guides. With long-interval feedings the babies could sleep uninterruptedly for longer periods, they were easier to take care of, and in every way the method seemed to tend to even, steady development.

*A Plea for Longer Intervals in Milk Feeding.*—DR. JULIUS H. COMROE of York, Pa., said that the average healthy infant received an excessive number of feedings during the first year; that such constant filling of the stomach was sure to result in trouble. Experiments showed that even after three hours residues of food remained in the stomach. Many of the symptoms, he said, classed as “insufficient feeding” were the direct result of too short intervals between nursings, and time should be given for the stomach to nearly empty itself before each feeding. While the intervals varied in which the stomachs of different children would empty themselves, and a longer period should be allowed for the artificially fed, he thought that four hours was a fair average time to allow between feedings. He said that the present statistics of the gastric capacity represented the anatomic, rather than the practical capacity, and that the amount of food to be ingested exceeded the number given by 3 or 4 ounces. But he had established to his own satisfaction the fact that the average normal child fed at long intervals would take more food than it could take fed at short intervals, and with less disturbance. The usual weight accorded to the normal child of one year was reached by his cases at ten and eleven months. He thought that more individualism should be shown, and instead of following the definite rules of the text-books for the modifications to be given at the different stages of infancy, each case should be a law unto itself. He found in his cases fed at long intervals that the child could take whole cows’ milk by the fourth month and was able to digest a higher caloric value than those fed frequently. He said that for the first two months the normal child should sleep twenty-two hours and that disturbance for frequent feedings lessened this time, therefore interfered with the growth and development of the child. He permitted the child to nurse until apparently satisfied, although he recommended a maximum of twenty minutes.

DR. LOWENBURG of Philadelphia from his experience would not endorse long-interval feeding, and said that Dr. Comroe seemed to become as dogmatic in his recommendations of long intervals

as he had criticized others for being in the short intervals. He said that one would hardly be justified in giving up a practice that had proven successful for one which had only been tried experimentally on a preconceived idea. Statistics in his practice did not show that infants fed at long intervals could take any more food, or of any higher caloric value than those fed at the usually recommended intervals. He did endorse heartily the doctor's closing remarks that each case was a law unto itself and should be handled as conditions seemed to demand.

DR. MILLER of Atlantic City said that he had found that the stomach was not empty until after four hours, but agreed that the rule that had proven satisfactory to a doctor should be the one for him to follow. He thought that when a child showed evidences of disturbance and vomited long intervals between feedings would be a decided benefit, but where they showed no such disturbance, and the doctor had previously had good results with short-interval feedings, he should not be hasty in changing.

DR. MORSE of Boston called attention to the fact that in the charts Dr. Litzenburg showed most of the babies weighed at least 4 pounds, and all were able to take the breast. He said that was not the type of infant that is usually meant by the term "premature." He said that when you had under consideration a child that could not be handled at all, that could not take the nipple, and could scarcely swallow, when you did well if you got a teaspoonful of food into its mouth and it was able to take it he did not believe enough food could be given it once in four hours to keep it alive. He did not believe American pediatricists were any more routinists than others but where a method of feeding had been employed successfully in some cases, a doctor certainly had ample reason for using it in others that were apparently similar in every respect. He thought babies were rarely overfed, that an energetic, normal child could take care of all the food it would take in twenty-four hours, but when one had under consideration a sick infant, that was another matter and he believed there was scarcely a pediatricist in practice who did not modify all his rules to meet the needs of that individual case.

DR. ROYSTER of Norfolk, Va., said that a baby was a very poor laboratory as a guide to proper feeding measures, no two being alike; that no one could apply the "rule of thumb" to the extent of saying that there should be so many grams of stool to so much food. He thought that the best rule was weight, upon a carefully balanced scale. He said that if it were possible to secure, through a catheter, the contents of a baby's duodenum the possibility and probability of measuring the digestion would be possible, but since that was not possible each case should be studied individually and its feeding and treatment fitted to it. He wished Dr. Litzenburg to say when the child of the eclamptic mother was put to the breast, what the condition of the albumen was, and the toxicity of the milk.

DR. ENGLISH of Summit, N. J., said that he did not feed babies



with any clock regularity. He thought that the proper time to feed a baby was when he woke up and cried and nothing else would satisfy him. He said, however, that every other measure should be tried before feeding, and that after it had been you had the benefit of the stimulation of the gastric juices through intense desire, which aided digestion materially. He thought that scarcely two children would digest their food in the same length of time, and that the stomach should have had an opportunity to rest and contract thoroughly before more food was put into it. His general instructions to mothers were to feed no oftener than every three hours, but if the child would be contented without food for eight hours he did not think it should be fed sooner.

DR. HESS of Chicago said that when each baby had been fed in accordance with its individual needs, and every baby had mother's milk the whole problem would be solved. He said that his paper, which had been referred to, considered only babies weighing under 1500 grams, one weighing only 690. Those weighing 1500 grams were fed 110 to 130 calories, and those below an average of 140 calories. He believed that a premature infant should be fed more than a full-term baby to gain. In his cases practically none gained on less than 90 calories. Since this series of cases were under observation he had been feeding less frequently and believed that he got best results from three-hour feedings up to the time that they reached normal birth weight, making up the number of calories by concentration. He said that they used to feed dilute food, but now were feeding more concentrated, nearly normal whole milk.

DR. SOUTHWORTH of New York said that in Germany there was a reaction from the four-hour interval and where milk is not sufficient supplemental feeding was resorted to and every means taken to stimulate the flow.

DR. MCKEE of San Francisco said that he had used the four-hour interval successfully in his practice and with great satisfaction. He said that this method admits of as much individuality as did the short-interval. He said that they were laying especial stress upon teaching proper feeding, and various modifications of cow's milk, and that they found their chief opposition came from the manufacturers of proprietary foods. He thought that the section should take action against the free admission of these manufacturers into the exhibit hall of the meeting and the pages of the Association Journal.

DR. ZAHORSKY of St. Louis said that the time when a baby's stomach was empty depended almost entirely upon the amount of food that had gone into it. He thought that the main objection to the four-hour feeding was that it necessitated a night feeding for the first five months, while with the three-hour interval this could soon be abandoned.

DR. LITZENBURG in closing the discussion said that he had no propaganda, that the method which he had used so successfully



was of no value for children weighing less than three pounds, but that he merely reported his experience thinking that some one who had tried everything else and failed might try this and save a child. He said that case six was absolutely unable to swallow, but that it was fed every four hours just what it was able to take, first of water, then dilute mother's milk, at first poured down the nose, then gradually, as it became stronger, by mouth. He said that the period of gestation in the series varied from seven to eight months. In reply to Dr. Royster he said that the baby of the toxic mother was fed by others until the mother was over her toxic symptoms. These babies, he emphasized, were not fed according to rule, but according to their digestive ability, and the only recommendation he had to make was that the method be tried in other cases and that results be reported to see if the results in a large number of cases proved there was merit in the method.

DR. COMROE in closing said that the only criticism of his method seemed to come from those who had had no experience with it, therefore it could not add much weight. He said that in his experience infants soon adjusted themselves automatically to no night feeding. He thought that his charts showed that he was getting away from dogmatic feeding, but where the old methods did not work, and the babies were not doing well, he thought that this method presented a phase that might be tried out.

*(To be continued)*

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## REVIEW.

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INFANT FEEDING. By CLIFFORD G. GRULEE, A. M., M. D., Assistant Professor of Pediatrics at Rush Medical College (in affiliation with the University of Chicago; Attending Pediatrician to Cook County, Provident and St. Bernard's Hospitals, and to the Home for Destitute Crippled Children, Chicago; Associate Pediatrician to the Presbyterian Hospital, Chicago. W. B. Saunders.

The writer of this book states that he has endeavored to do two things:., First, to bring our knowledge of the scientific processes which underlie infant feeding up to the present, and second, to put forth the practical application of these principles in such a way that they can be grasped by one no more familiar with the subject than the practicing physician."

One certainly cannot endeavor to do more but the author falls so far short of his purpose that a perusal of the book gives rise only to disappointment.

The second chapter is devoted to the anatomy and the third to the physiology of the gastrointestinal tract in the infant.

The most important features of these subjects are given in a very cursory way. In the fourth chapter devoted to absorption and metabolism the writer gives a brief summary of the subject but falls far short of its possibilities. This chapter contains a great number of half truths and ambiguities which if taken literally will certainly lead to false impressions. For example, on page 35, it is stated that in new-born infants Langstein and Nieman found a negative nitrogen balance for the first five to eight days. This statement is true so far as it goes but the writer makes no mention of the fact that the infants were fed mature milk from wet nurses and did not receive colostrum and the early milk secretion which is obviously the physiological occurrence. Neither does he mention that the work of others on new-born infants who were naturally fed showed a nitrogen *retention* during this period instead of a nitrogen loss.

On page 36 following the statement that creatin is more frequently present in the urine of children than in that of adults the author says: "Niemann has determined the same for uric acid." Surely the writer does not wish to imply that uric acid is rarely present in the urine of adults and occasionally absent from the urine of infants. We know that uric acid is always present in the urine of all individuals at all ages. The work of Reusing, Sjöqvist, Orgler, Göppert, Niemann and others merely shows that there is a greatly increased uric acid output in the new-born infant and a greater excretion per kilo of body weight in infants than in adults. Many such examples of ambiguity or error could be cited but one more will suffice.

On page 44 the writer says: "According to Moll, well breast-fed infants have not phosphorus in the urine in sufficient quantity to estimate by our present methods." The method advocated by Moll was merely a uranium acetate titration of a small amount of urine to determine the presence of inorganic phosphorus or phosphates. This method of determination does not determine the total phosphorus. Moreover, Moll did not claim that even inorganic phosphorus was absent but merely stated that it was present in quantities too small to estimate with uranium acetate when small amounts of urine were used. He states that the normal breast-fed infant excretes from 10 to 20 mg. of  $P_2O_5$  a day which urine he considers practically phosphorus free.

In the paper of Langstein and Niemann quoted in the next paragraph the method of phosphorus determination was not stated but presumably they estimated the total phosphorus (inorganic plus organic) and they presumably used comparatively large amounts of urine for the determination. For reasons stated before it is somewhat questionable whether the results of these writers apply to the normal new-born infant and other observers have obtained different results.

The chapters devoted to breast feeding are good and are in accord with the generally accepted views.

In the sections of the book devoted to artificial feeding the views

are those of the German school and there are many statements with which American pediatricians will not agree. For example, the writer states that from the sixth to the twelfth month an infant should gain only two to three ounces a week. Again, "a gain of 8 ounces a week should always make us apprehensive, because almost invariably such an *excessive* (italics mine) gain in weight is followed by a catastrophe." Such statements require no comment.

The description of the technic of artificial feeding and the adaption of the food to the needs of the infant is totally inadequate. It is to be feared that one unfamiliar with infant feeding would have great difficulty if his knowledge were restricted to this book. After giving three sample formulas for infants under three months of age the author says: "With the use of such a formula, one can scarcely expect to have a child gain normally in weight, but one, in large measure, can avoid nutritional disturbances which are of such grave nature when they affect the infant under three months of age."

The chapters on the nutritional disturbances of artificially fed infants are especially good and contain descriptions of the teachings of Czerny and Kellar and the Finkelstein school. In illustration of the various nutritional disturbances the excellent diagrams of v. Pirquet are given. It might be added that these are by far the best illustrations in the book.

Special sections are devoted to the subject of the premature infant, the exudative diathesis, the spasmophilic diathesis, rickets, scurvy, eczema and pyloric spasm and stenosis. These chapters contain nothing original nor is the writer's treatment of the subjects worthy of special comment.

Throughout the book there are a great number of obscure passages and in a number of places the language is so obscure or involved that it is difficult if not impossible to ascertain the author's meaning.

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## BRIEF OF CURRENT LITERATURE.

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**Study of Icterus Neonatorum by Means of the Duodenal Catheter.**—Tests by A. F. Hess (*Amer. Jour. Dis. Child.*, 1912, iii, 304) by means of the duodenal catheter show that bile is very rarely excreted during the first twelve hours of life; it was obtained but once in the course of fifty-two tests. Bile excretion during the subsequent twenty-four hours is variable; in cases of marked jaundice it is profuse; in cases not jaundiced it is scanty or absent. The function of excretion gradually becomes fully established during the first week or ten days of life. Where jaundice manifests itself, it precedes the excretion of bile into the duodenum. Secretion of bile varies within wide limits. In



general it is marked when the jaundice is marked. The occurrence of jaundice results from a defective correlation of excretion and secretion. It is generally caused by the inability of the rudimentary excretion to cope with the sudden profuse secretion of bile. It would seem beyond doubt that in most cases of icterus neonatorum there is a disturbance of secretion, a polycholia, or a mere increase in the formation of bile pigment, pleiochylia. In many of the cases of marked jaundice this hypersecretion reaches an intensity so marked that bile overflows into the stomach, where it may be found on introducing the stomach tube, or manifests itself by its presence in the vomitus. It seems probable that this pleiochylia is due to an increased amount of available hemoglobin; that bile salts are absorbed from the intestine, resulting in a disintegration of blood-cells and a consequent elaboration of bile in the liver. There is a coincident disturbance of excretion, and it is probable that were excretion as well provided for at birth as in later infancy, there would be no disturbance such as icterus neonatorum. During the first hours of life there is practically no functioning excretory mechanism, and this function manifests itself but gradually. The bile is secreted under low pressure, but where an excess is secreted, as is generally the case in jaundice, the pressure is proportionately increased, so that a profuse excretion of bile into the duodenum is obtained. Nevertheless, congestion of the biliary capillaries ensues, and icterus results. The reason why jaundice appears in the first days of life is because at the time when excretion has incompletely assumed its function throughout the body, in the liver as well as in other organs, for example, in the breasts and in the kidneys, a sudden flood of bile is poured into the passive excretory ducts and gains access to the hepatic circulation.

**Tonsils in Childhood.**—J. G. Wilson (*Amer. Jour. Dis. Child.*, 1912, iii, 277) says that since comparative anatomy shows that in all cases a communication with the pharynx has been preserved, it would appear that intimate relationship with the pharynx is a necessity of tonsillar activity. The tonsillar activity is to be regarded as most active during developmental life. There is no evidence that in man it should be regarded as a recessive organ. The tonsil cannot be regarded as merely a lymphatic node. Though it presents microscopically adenoid tissue, yet its developmental history and its physiologic activity at least make us pause before drawing such a conclusion. It is just this presumption that has led many to a hasty and unnecessary enucleation. The statement some have made that since the tonsil is only a lymphatic gland its activity can be readily replaced by other lymphatic structures is of very doubtful merit even so far as lymph-nodes are concerned, and erroneous so far as the tonsil in the child is concerned. We have every reason to believe that the tonsil plays an important rôle in the complex changes which occur at the upper end of the alimentary tract. The argument that noone has seen any local or systemic deficiency following removal of tonsils in childhood is not convincing since we have not



sufficient observations based on complete enucleations. All are agreed that if the tonsil be diseased it should be removed; but it is sometimes not a simple matter to recognize a tonsil which demands removal because of disease. It is not easy to say whether it is diseased primarily or whether its pathologic appearance may not be secondary to disease elsewhere, either in its immediate neighborhood or arising from systemic causes. A large tonsil in a child is not necessarily pathologic; a normal tonsil may project considerably beyond the pillars. In many systemic diseases, apart from any local affections, it becomes enlarged. Mere fluctuation in size in a child ought not to be regarded as a sign of disease and an indication for enucleation. The association of pharyngeal and rheumatic attacks are, however, insignificant. The writer regards the tonsils as protectors of the upper respiratory and alimentary tracts and so feels called upon to protect them during the period of functional activity, that is, before puberty, unless he is convinced that on account of disease or loss of function they are not only a source of infection but are having an injurious effect on the structures around.

**Utility of the Vacuum Bottle in Infant-feeding.**—F. O. Tonney and H. H. Pillinger (*Jour. A. M. A.*, 1912, lviii, 1495) state that, properly used, the bottle not only keeps the milk warm, but effectually pasteurizes the milk; in fact, the method amounts to a prolonged "holding process," reducing the bacterial count to practically *nil*. The bottle if placed in a warm place will maintain a proper temperature for ten hours or more. The temperature below which the bacterial growth begins is about 115° F. If incubating-temperatures are used, or if the temperature falls below 115° F., the practice is extremely dangerous, because of excessive bacterial multiplication. The use of the vacuum bottle should not be attempted for purposes of infant-feeding, unless it is controlled by means of a thermometer. The milk, properly modified, should be warmed to 150° F. and poured into a vacuum bottle previously warmed with hot water. This is stoppered tightly and put in a warm place. At feeding time the temperature of the milk is tested with a short thermometer which is kept inside the bottle to minimize the danger of bacterial contamination. The milk should not be used to fill the nursing-bottle, under any circumstances, if the temperature has fallen below 115°.

**Effect of Cold Fresh Air on the Blood-pressure in Pneumonia of Children.**—The observations of J. Howland and B. R. Hoobler (*Amer. Jour. Child. Dis.*, 1912, 294) show that the effect of cold fresh air in patients with active pneumonia is always to produce a rise in blood-pressure and that removal to a warm but well-ventilated ward is to produce a fall in blood-pressure. The rise is not apparent until half an hour or more, sometimes not until an hour, after being put out of doors, and it does not reach its maximum for about two hours. Thereafter the effect, so far as observed, is continuous for even as long as thirty hours, with no tendency for the pressure to fall as if from exhaustion of the

effect. On the other hand, after removal from the cold fresh air the blood-pressure falls rapidly; the fall is apparent in fifteen or twenty minutes and usually reaches its lowest point in an hour, to remain at this minimum unless influenced by the course of the disease, by stimulation, or by the child's again being placed out of doors, when it again rises. In convalescents, on the contrary, the results are usually much less striking and may even be absent. Instead of a rise of 10 or 15 mm. of mercury, the difference is only a few millimeters or none at all. The writers have been unable to produce results by putting children out of doors in warm weather; as the temperature increases in the spring and the out-of-doors temperature approaches that of the ward, the effects are less and less marked until none whatever is produced. It would seem, therefore, that the all-important factor is the cold. Whether it is advantageous from the standpoint of the circulation to raise a blood-pressure which is at an average point or slightly above this is a question which cannot at this time be answered. It may be that the pressure is only maintained at this point by an unnecessary cardiac exertion accompanied by a very rapid pulse and that a high pressure, reflexly produced through the vasomotor system, may allow of greater rest to the heart. It is possible that from the beginning of the disease when the blood-pressure is not low, cold air may have a beneficial tonic action on the vasomotor center so as to render it less likely to be profoundly influenced by the organisms or their products, and it seems very likely that the other beneficial effects of cold air may so modify the disease as to render less likely the development of partial or complete circulatory failure.

**Amaurotic Idiocy.**—J. Turner (*Brit. Jour. Child. Dis.*, 1912, ix, 193) records two cases of amaurotic idiocy both of which were far older than cases of this affection usually are. One died of an intercurrent complaint at the age of fourteen years, the other was over five years at the time of death. The latter was of British extraction with no known Jewish ancestry and is said to be the only instance among 100 cases on record in which the child was not Jewish.

**Nutrition and Digestion of Infants.**—As a result of the study of eighty-two infants with varying grades of indigestion and malnutrition M. Ladd (*Arch. Pediatrics*, 1912, xxix, 324) concludes that many atrophic infants can be educated to take higher percentages of fat than are ordinarily given, with satisfactory results in weight development. The average rate of gain in atrophic and undeveloped infants who are fed upon whey mixtures with lactose for prolonged periods was 18 ounces per month. When malt sugar is substituted in these mixtures for milk sugar, the rate of gain is increased to 22  $\frac{2}{3}$  ounces per month, or an increase of 26 per cent. Two series of infants were fed upon plain cream mixtures with barley starch and the excess of sugar was supplied in the form of maltose (maltose and dextrin-maltose). In one group the mixtures were not pasteurized; in

the other group the food was superheated to a temperature of 212° F. for twenty minutes. The rate of gain in each group was the same; that is, 21 1/4 ounces per month. Boiling the milk did not in any way lessen its nutritive qualities. The possibility of scorbutus was guarded against after several weeks of feeding by small daily doses of orange juice. Individual cases often did better upon the superheated than upon the raw milk. With an occasional exception the infants did not make satisfactory gains in weight until the energy quotient was raised to 140 to 160 and sometimes to 175 to 190. Generally speaking, the energy quotient is greatest when the weight development is farthest from that of the average normal infant, as determined by the weight chart. The quantity of food to be given an atrophic infant is only a little less than that which the normal infant of the same age receives, and is often from 1 1/2 to 2 ounces more than would be given to the normal infant of the same weight. The detailed study of the weight and feeding charts in a large series of cases shows great variation in the individual requirements and the impracticability of applying general rules of feeding to the atypical and difficult cases.

**Inclusion Bodies in the Blood of Scarlet Fever as a Means of Differential Diagnosis.**—In 1911, Döhle reported that in thirty cases of scarlet-fever blood examined by him he found almost without exception in the polymorphonuclear leukocytes certain inclusion bodies which, to the best of his knowledge, had not been previously described. Kuetschmar has confirmed these findings in all of thirty cases of scarlet fever examined and in only three of seventy controls. M. Nicoll, Jr., and A. W. Williams (*Arch. Pediatrics*, 1912, xxix, 350) have studied blood smears from fifty-one cases of scarlet fever, together with some twenty-five control cases, with the result that forty-five cases of scarlet fever showed inclusion bodies such as Döhle described and six failed to do so. The method of examination was as follows: Two or three blood smears were made from each case, one stained with Manson's stain (borax methyl blue), another with Giemsa's stain over night. The inclusions were found chiefly in polymorphonuclear leukocytes and varied in size and shape from small coccus forms to large irregular masses one-fifth the size of a red blood cell. Bacillary forms were also seen. With Manson's stain the nuclei take on a deep blue color, the cytoplasm very faint blue, the inclusions a tint between these two. With Giemsa, the inclusions take on a clear delicate blue identical with that of the plastin; the nuclei, magenta. With Manson's stain the inclusions stand out more clearly as the cell granules stain but feebly. In fresh cases of scarlet fever the bodies are found in nearly every polymorphonuclear leukocyte. In one case the bodies were found on the twenty-eighth day. In general, it may be said they are found during the first week at least. Of twenty-four control cases, three only showed inclusions, namely, a case of pneumonia in a luetic woman, one of erysipelas in an infant, and one complicated measles case, the



last probably a real case of scarlet fever. The authors believe that a blood examination in the first week of the disease will serve to differentiate scarlet fever from measles, German measles, and probably toxic eruptions. Whether a similar differentiation may be made in the case of rashes due to sepsis, influenza and tonsillitis must be left to be determined by further study.

**The Temperature of Children.**—In a report of the findings in taking the temperatures of 1000 children, M. H. Williams (*Lancet*, May 4, 1912) says that two points are commonly raised in regard to pyrexia in children: first, that the condition is due to nervousness; and secondly, that children's temperatures "run up for nothing." There is a very definite foundation for the first point. Nervous children bulk largely among children with raised temperatures, but the typical nervous child is the rheumatic child, and the rheumatic toxin is the agent causing both the nervousness and the pyrexia. The second point is a mere statement that many physicians find raised temperatures in children, after some slight disturbance, without being able to ascertain the cause. It by no means shows that there is not some constitutional cause present, provoked into action by the slight disturbance noted.

**Clinical Value of Albuminous Milk.**—E. Weill and G. Mouriquand (*Jour. de méd. de Paris*, June 22, 1912) has fed on so-called albuminous milk, made after the directions of Finkelstein, ten sick infants, and afterward six well ones. Of the sick infants, nine died. Autopsy showed two deaths due to bronchopneumonia, one to duodenal ulcer, and seven without any cause that was evident. The use of this form of food caused the children, both sick and well, to lose weight and strength. The digestive troubles, such as vomiting and diarrhea, were increased by the use of the food. The six well children were chosen because of their robust health, and were fed with the albuminous milk, replacing two or three milk feedings with albuminous mixture. It caused the appearance of diarrhea where it had not existed, and the children lost weight. The author concludes that the use of such a method of feeding is injurious to both well and sick children.

**Acute Myelocythemia with Osteosclerosis in an Infant.**—A. Goodall (*Edinb. Med. Jour.*, 1912, viii, 500) reports a case of myelocythemia in an infant of ten weeks in which a fatal termination occurred in three weeks. The case appears to be the third on record in which leukemia has been associated with osteosclerosis. There was considerable difficulty in staining the myelocyte granules.



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# THE AMERICAN

# JOURNAL OF OBSTETRICS

AND

## DISEASES OF WOMEN AND CHILDREN.

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VOL. LXVI.

SEPTEMBER, 1912.

NO. 3

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### ORIGINAL COMMUNICATIONS.

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#### THE RELATION OF ATHLETICS TO THE REPRODUCTIVE LIFE OF WOMAN.\*

##### A Preliminary Study.

BY  
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New York.

WHEN I was requested to give a paper on this subject before the members of the obstetric section, I replied that in the brief time at my disposal—barely three weeks—it would only be possible to present some preliminary notes—the alternative being a more finished paper in the autumn; but since, even in that time, sufficient data for any definite conclusions could not be gathered, it seems better to open the subject now in the hope of stimulating discussion and gathering statistics for a more thorough and satisfactory paper in the future. That is my apology for offering this fragmentary study at this time.

The literature is distinguished by its paucity of material, giving few statistics or even opinions. It is probable that under other titles, references will be discovered that will help to illuminate the subject. Now and then the subject has been worked at, but not worked out. From the very nature of the case, statistics are difficult to obtain, and as a fact few have been collected except in relation to menstruation. In response to my various letters I have received a number of replies which are substantially as follows: "I am sorry to have no statistics, but I have many impressions." Some of the writers have very positive convic-

\* Read at a meeting of the Section on Obstetrics and Gynecology, New York Academy of Medicine, May 23, 1911.

tions.

This is peculiarly the age of the athletic girl. But at the the outset it is difficult to define just what is meant by athletics. Many differences of opinion are due to the premises on which those opinions are based. There are all degrees of athletics from the moderate careful training under a wise director to the violent stunts of over zealous young women, or the rigorous training essential to success in heavy competitive work. The old adage has it that there is "no smoke without some fire." We hear on every hand, "athletics are a menace to motherhood," "girls were not made for athletics." A very intelligent layman recently wrote me: "Athletics carried to extremes, as they are apt to be by the athletic girls of to-day who take great interest in contests and physical exercises, will unfit those girls for maternity. Whatever the doctors may hold as a general theory on the subject, I, personally, know two or three stunning girls who have wrecked their health by over-exercise. One of them died in childbirth. Another is so wretchedly ill that she would prefer to die, and a third is slowly crawling back to health again after two years of invalidism."

Has such a judgment any scientific basis, or is it but a lay scarecrow tending to debar our girls from the rich fields where health and happiness await them? At any rate it behooves us in spite of the numberless sources of error to get an all around conception of the facts of the case that where harm is being done we may sound the warning. On the contrary, we must not, without ample justification, limit the activities which, theoretically, at least, mean the salvation, physical and mental, of our women all the way from childhood to old age. Amusement they are bound to have. Shall it be by increasing indoor social functions, teas, epicurean dinners, the confined air of the theater or ball-room, or shall we as physicians so direct and control the situation that our growing girls, our young women in particular, shall have all the joy and exhilaration of increasing out-of-door life, steeped in fresh air and sunshine, the whole woman invigorated by intelligent athletic activities, quickened circulation, improved appetite, a better balanced nervous system, and a saner outlook on life and its responsibilities?

Letters and personal interviews have yielded such a wide variety of opinions that I can only attempt to tabulate them at this time.

I have communicated by letter or in person with a considerable

number of eminent obstetricians, college physicians, directors of physical training in universities or private gymnasiums, with some athletes whose individual experience can be relied on, and with the scanty literature at present available on the subject itself or germane to it.

The answers have varied greatly on important points—they have been in the main frankly indefinite, stating that they had no data on this phase of their work—many had impressions—sometimes very definite ones. All said that there was practically no literature with which they were acquainted.

A tabulation of such replies will, I believe, be helpful for our present study.

We may in a general way divide the subject into athletics:

1. As related to menstruation.
2. As related to parturition.
3. As related to displacements.
4. As related to convalescence and lactation.
5. As related to lactation.

The question of sterility has been statistically studied among college graduates. Unless we concede that displacements are caused by athletics, sterility would seem not to depend upon any particular physical training, but rather upon sociological and economic considerations.

#### HOW DO ATHLETICS AFFECT MENSTRUATION?—EXCERPTS FROM LETTERS AND INTERVIEWS.

4. "Moderate or violent exercise during the catamenial period has a stimulating affect on menstruation, and is for that reason dangerous or at least evil in its affects. Violent athletic exercise is not compatible with the normal sexual life of women. The condition of the pelvic organs reacts in a general way to a better condition of the muscular system following outdoor athletic exercise."

7. "In Britain we go in for lots of athletic exercise, and I am quite sure we have less dysmenorrhea than the average American girl. One never talks of being 'sick' and never thinks of giving up things because of menstruation the way American women do."

11. "Athletic exercise is beneficial to menstruation. It increases the pelvic circulation. I allow moderate exercise during menstruation. The normal girl can do even violent exercise



without its being dangerous, except broad-jumping, vaulting, etc., when menstruating. I do not believe in intercollegiate contests for men or women. They go too far unless under remarkable supervision. They strain heart and lungs."

12. "Athletics are beneficial in general. Before menstruation is established, care should be exercised during the period. After establishment a girl can judge when she is over-doing—different for different girls. The normal girl can exercise during the period. She should probably not do as strenuous exercise during the period, as broad jumps, vaulting, etc., and she should not exercise as many hours. I do not think intercollegiate contests best on account of menstruation."

13. "When properly controlled by the Director, gymnastic exercise in my experience, has affected menstruation favorably, but a game of basket ball played during menstruation has been known to produce endometritis in a girl, which later demanded a curetage.

14. "In the early period of puberty, rest is important to avoid using up the vitality which should go to the development of the reproductive system. Anteflexion associated with infantile uterus is very common. Avoid dancing the first day. Between periods, moderate athletics, not violent."

15. "No severe work should be allowed during menstruation. A moderate amount of games allowable if regulated, but since that seems impossible, it is better not to engage in them."

8. "A physically well girl may indulge in hygienic exercise at any time in moderation and improve in health. She might seriously injure herself by immoderate dancing, ice-skating, etc., at the period."

10. "All the students in our physical training class worked through the period without any noticeable ill effect."

#### SUMMARY ON MENSTRUATION.

Most schools, colleges, and gymnasiums for girls excuse their students from physical exercises for one to three days during the period, though in one widely known physical training school for teachers, one of its graduates informs me that in her day, when in full training they did the regular work without any ill effects. This is also true of all circus women who must work throughout the period, most of them do not suffer from dysmenorrhea. In a number of cases cited the flow ceased during the excitement of performing, sometimes the flow was more profuse.



All agree that moderate athletic exercises between periods are beneficial for girls.

Many would rigorously interdict exercise during that time, others allow moderate exercise to normal girls during, as well as between periods, but believe violent exercise during periods dangerous to all women.

A few approve of violent work at any time in cases where they are in full training.

In 1875 Mary Putnam Jacobi wrote: "A long series of observations proves conclusively that there is nothing in the nature of menstruation to imply the necessity or even the desirability of rest for women whose nutrition is really normal, on the contrary, when women exhibit mental inability and consequent weakness at or before menstruation it is proof positive that the resistance of their nerve centers is weakened below the normal standard. For these cases rest is desirable during whatever period of the month the nervous excitement may be experienced."

Twenty-five years later Dr. Engelmann read his valuable paper on the *American Girl of the Day* (1900), *Modern Education and Functional Health*. We hope to be able to collect material to bring these data up to date. The value of physical education for girls has made rapid progress since he gathered his statistics, but his conclusions at that time are most important for us. The following extracts are from his monograph. "It is above all to physical trainers that we must look for the correction of existing evils, hence, I urge upon them more especially, as I do upon the physician, the study of the developmental period, of the sensitive, responsive organism during the great waves of sexual life." Again, "Physical exercise regulates both frequency and duration, bringing about a healthy change with approximation to the normal moderating frequency and amount if too great, and increasing it if menstruation is delayed. In one institution 18 per cent. suffered severely before and only 10 per cent. during or after, entering upon the course. This is especially marked in the pupils of physical training schools." Large numbers of statistics bear witness to the improvement in menstrual well-being in schools where physical training is a feature. That is in its broadest significance, attention to all that concerns the welfare of the girl. "It is very noticeable, however, that those who take life more seriously, and have already experienced the results of carelessness or neglect at that time, are those who avoid unnecessary exertions during the menstrual period—that is nurses, physical

trainers, and older college girls." Engelman's profound study of the subject led him to the opinion that physical training should be compulsory in the periods preceding puberty, and during puberty. "Physical training begun in early life, and the habit of exercise will do much to remove the susceptibility to injury during the physiological fluctuations of the functional wave, as we are taught by the acrobat, who under constant training from childhood on, persists in her trying feats, requiring the greatest nerve and muscle strain, and the highest coordination of all powers throughout every functional change, unaffected by the menstrual period." Engelmänn writes again: "I have sought to present conditions as they exist. That they are not what we have a right to expect is apparent; the cause is, to a great extent, a misdirected refinement of civilization—ignorance of and disregard of the function, the crushing out of every question of sex in the girl, who soon learns to ignore, conceal and deceive." This is followed by an earnest appeal to the triad upon whom the chief responsibility rests—the mother, the physician, the educator.

In our anxiety to be always on the safe side, arguing that girls have no sense and that they cannot be trusted in athletic work, we must not deprive them of their birthright—the right to enjoy and be benefited by all that sports and exercise can do for them. They must be trained to be trustworthy. Often our negotiations are the result of our ignorance. In this athletic age we must face the responsibility of intelligently advising women—young and old—along athletic lines. Very often it would render our drugs unnecessary by substituting far more natural and effective therapeutics.

There is considerable interesting reading on this subject in the history of primitive peoples, and the peculiar care given to young girls at this time. "The necessity of functional hygiene for the welfare of the community was recognized to such an extent, that it was made obligatory by laws of custom or religion—and everlasting damnation, and even death, were imposed for certain transgressions of these laws—transgressions which are thoughtlessly practised to-day."

#### HOW DO ATHLETICS AFFECT PARTURITION? EXCERPTS FROM LETTERS AND INTERVIEWS.

2. "I am very optimistic. Athletic women do splendidly—they have easy labors."

8. "One of the most normal obstetric cases I have had recently was that of a woman nearly thirty who has always been active in outdoor life of all kinds—tennis, horse back riding, etc. I would rather take chances in office and obstetrics with one hundred athletic, than with a hundred house-bound and sedentary women. It takes three generations before we can prove anything along such lines as this."

10. "The athletic woman is going to have an easier labor."

12. "Moderate athletic exercise favors parturition. If some of our upper classes could earn their bread by 'the sweat of their brow' there would be less nervous troubles, heart failure, dystocias, etc. Athletics are the next best thing."

24. "All other things being equal, the athletic woman has the easier labor—perineum negligible." Cited case of a great tennis champion who had a very easy labor."

27. "Athletics favor easy delivery. No important effect on perineum. Abdominal muscle useful in second stage. Nervous influence great. Among cruder people I have often noticed attention of patient so distracted when instructor brought in student or spoke with him that labor pains ceased for two to three hours. The more highly educated, fanciful woman has those distractions in herself; she has been led to anticipate trouble, etc. Athletics give good line of thought."

9. "I expect the devil of a time with athletic women, tennis champions, etc. Vis a fronte so much more powerful than vis a tergo. I do not know why—perhaps the circular fibers are more developed than the longitudinal muscle fibers." Cited case, very relaxed, wide separation of the recti, very easy labor.

13. "The reproductive system is often dwarfed by the force going into overdeveloped arms and legs. The abdominal and pelvic muscles and ligaments do not necessarily share in the general muscle development. These patients often have rapid, uncontrollable labors (perineal muscles not necessarily overdeveloped), with unavoidable deep lacerations. Do not bear pain as well. Women are not fitted for athletics."

14. "The true athletic girl tends to a more tedious labor (all other things being equal) than the average nonathletic girl. This comparison implies equality in the nervous apparatus of both. Overmuscular development, if of the true type, causes a slow average labor. (1) These women do not settle as early and completely owing to the more muscular cervix, uterine ligaments, etc., hence, preparation for labor is not as complete.



(2) Dilatation slower, (a) improper preliminary preparation, (b) not infrequently a rather wide curved muscle band in the vault of the vagina in front of the cervix tending to make dilatation slower. (3) Highly developed muscular floor (of secondary importance). (4) Fair number have well-developed muscle ring encircling the vagina one and one-half inches above the perineal floor proper which often delays considerably."

20. "Athletic women have long hard labors—muscles of pelvic floor less flexible and not sufficient force to overcome them."

22. "I have had no experience in athletic training of women during pregnancy. My impression is that athletic women have the hardest labors. One-half dozen or so of my patients who were athletic enthusiasts had difficult labors, the majority requiring forceps."

23. "Excessive indulgence in athletics in young women has an unfavorable effect upon child bearing. I am not sure of the exact reasons for this. Moderate training in the right kind of exercise involved in outdoor games, athletics and dancing is favorable."

31. "No special obstetrical athletics desirable. More difficult labors. Muscular tissue harder, more unyielding. Commend me to relaxed, flabby-muscle women for easy labor. In the athlete, or the more highly developed physically, the resistance offered by cervix and perineum is greater than uterine development. The nervous condition suffers at expense of our modern life."

9. Three teachers of physical training of different schools, Swedish and American, or as some would call the latter modified German, all great horseback riders, cross saddle, report that two had very easy labors, but that the third lost her child because her muscles were so hard, and the perineum so inelastic.

5. "The type fitted for athletics is not fitted for labor—no effect on cervix or pelvis—perineum negligible."

18. "A very strongly developed muscular woman may have an easy childbirth, but sometimes the lacerations are very serious as the result of unrestrainable labor pains, and precipitate delivery."

29. "Some reports of our students are favorable to the work in the university gymnasium, others unfavorable."

13. "My work is almost altogether among native born, prosperous Americans of the race suicide practice—large families are the exception. The women live easy lives—little attention is



paid to athletics—not enough housework to take the place of athletic training. More hard labors than formerly. The easy labors are among working women who work hard every day.”

6. “Those leading laborious lives have as a mass easier labors. Innervation largely at fault where labors are difficult. In the majority of hard labors the nerve force has already been exhausted. Patients are worn out with social duties, force spent, and when it comes to a great effort they are not equal to it. Naturally, lax-fibered persons have easier labors. Muscles of Indians are soft like a frog’s. Squaws in the uncivilized state have notoriously easy labors.”

26. “The important thing is—who is in better condition for labor, for any necessary operation, and for recovery—decidedly the athletic girl. Athletics do not affect the perineum. The general condition is much better, which, barring the tremendous nervous element inevitably associated with our modern urban life, would give easy labor. Housework most valuable. Telephone, social engagements, etc.—and strain, play the mischief.”

#### NOTES ON CIRCUS PERFORMERS.

2. Bareback rider, thirty-five years old, fifty jumps in six minutes through hoop. First menstruation at sixteen; married at seventeen; dysmenorrhea which antedated marriage, flows five days. Works throughout, headache, dizzy, but head clears when she enters ring.

First pregnancy—miscarriage at three months, after fall.

Second pregnancy—rode to eighth month, child at term, 9 pounds.

Third pregnancy—miscarriage at sixth month, after fall.

Fourth pregnancy—rode to eighth month, child at term. Rode two to four weeks later, no leucorrhea.

4. Rider; rode to eighth month; abundance of milk at three months. None ever heard of a woman breaking down.

5. Mother of number three. Rider; had six living children; rode eight and half months with third child.

7. Trapeze; twenty-five years old; married nine years; circus nine years; began at sixteen; miscarriage at four to six weeks. Menstruation regular six to seven days; no pelvic pain; flow stops while performing.

These women wore no heavy skirts or corsets. Career begun in childhood; nervous system has no new shock. Muscular attachments of uterus probably unusually firm.

Hippodrome acrobat; tumbler; hand balancing—twenty-seven years old. Began training at five years, trapeze and rings. First menstruation at twelve; always regular; five days; moderate flow—no nausea or vomiting; no cramps; occasional headache. Flow does not stop while performing. Married at twenty. First pregnancy; performed until fifth month; very easy labor—twelve hours. Second, very easy labor—half an hour. After three months went back to the stage; plenty of milk.

Mrs. Hosfall; father American, mother Indian, educated by missionaries in summer, the rest of the year followed the band of Indians. Married at twenty; trapped with husband, poles, tracks boat, handles ax, builds cabin, shoots, hunts, cooks, skilful in Indian woman's practical work, dressing animals, tanning, etc. Four healthy daughters in five years. Two youngest each born on the bank of the river, many degrees below zero, when she was entirely alone, and must keep fire, cook, etc. Passed through it all successfully. Advantage of leading natural life.

#### SUMMARY ON PARTURITION.

Among forty answers the opinion is almost universal that the general condition of athletic patients is much better.

Two refer to tremendous muscular force making delivery uncontrollable and producing severe lacerations.

More than half believe that athletics favor easy labors, others state that moderate athletics favor labor while excessive exercise hinders it, still others believe that among their athletic patients there are as many easy as difficult labors. About one-fourth are very decided in their opinion as to the increased dystocia due to athletic training though some of these say they would prefer to take their chances with the woman who goes into labor in a condition of heightened physical well-being. A few describe the perineum as being like iron, others speak of it as negligible as repair is easy. Most of the circus women had easy labors, most continued their work until the fifth month or later, one rode until eight and a half months, none had miscarriages unless due to a fall.

Uncivilized squaws have notoriously easy labors. Much dystocia is found, however, among foreign hard-working peasants due to causes affecting the bony structure and the general nutrition.

A more intimate knowledge by the obstetrician and the general practitioner of the advantages to be achieved by athletic, gymnastic exercises, whatever you may choose to call them, during pregnancy is urged in many German papers of the last decade.

Hegar writes that laxity of the abdominal walls after confinement is much commoner among German than among English women, and states as the reason for this that the general body musculature of the latter is in better condition through much movement, sports and fresh air. Advises use of massage and gymnastics to increase the muscle strength of heart, furthering the metabolism, improving oxygen carrying capacity of the blood, of so great value to the fetus.

Kirchberg advises exercises to increase strength and tonicity of abdominal muscles throughout pregnancy, also most important, breathing exercises not only for abdominal muscles but also for control of diaphragm and discipline of the will in using muscles. Increased appetite, easier breathing, and elevation of general tone result. He also makes a strong plea for the use of specific massage and gymnastic exercises during the lying-in period, as invaluable adjuncts in speedy and complete recovery, speedy involution, etc.

There should be a more profound understanding of the nervous system in tedious labors. When patients have been studied more universally from this standpoint the medical profession will more universally seek to understand the causes. Where it is impossible to alter them, some alleviation may often be possible, and the dystocia will not be laid to the charge of the particular *bête noir* of the physician—which may be athletics. In considering this subject of athletics for women we must make a careful discrimination between the work of the laboring classes and athletics. Athletics are chiefly taken up by the more educated classes—those who are living a more complex and less natural life, and are endowed with a delicately organized nervous system. Athletics are a nervous strain including little of the routine of the working woman's life.

A woman who has had wise graduated physical training up to what may be called moderate athletics is, setting aside abnormalities of bony formation, variations in temperament and nervous control, in the best possible shape for easy, uncomplicated labor, rapid convalescence, with the ability to nourish her own child generously with the ideal baby food, mother's milk.



The children of such mothers should, as far as the maternal influence is concerned, be of the best quality as to health and vigor.

#### DO ATHLETICS TEND TO PRODUCE DISPLACEMENTS?

2. "Because muscles and ligaments are strong, she does not suffer from displacements which may exist before labor. After labor the fundus flops back, and there may be a good deal of resulting wretchedness."

8. "Competitive athletics carry with them local risks of sufficient frequency and severity to make them usually unwise."

10. "Have seen many cases of prolapsed ovaries and displacements resulting from overexercise at menstrual period—gymnastic stunts, automobile riding, and high heeled pumps."

11. "Tennis and riding responsible for retroversions."

16. "Athletic exercise, gymnasium work, tendency to produce displacements, in some cases very sure this was cause."

5. "No displacements are due to athletics, but women are not intended for violent exercise."

1. "Not unless a heavy fall."

15. "Athletic work begun early prevents displacements; in my opinion I have seen flexions lessen under gymnastic work. Displacements, if present when the girl enters the gymnasium, sometimes become exaggerated, for instance, a retroversio uteri will be positively increased by the exercise of lying on the back on the floor, legs raised to a right angle with the trunk."

4. "I am opposed to strenuous competitive games. Active physical exercise improves pelvic conditions. In the great majority of cases retroversion and prolapsus in young women are the result, not of sudden strain or overexertion, but of weak circulation, weak muscles and ligaments, slowly increased congestion often from pressure of clothing, habitual constipation, etc. I believe that physical activity for girls is tending toward good. The great danger in athletics, out- or indoor, is due to the spasmodic attempts to do heavy work when not trained up to it."

12. "Displacements are not produced, I don't believe you could get one. The girl who gets into trouble is not the regularly trained athletic girl, but the one who comes back from Palm Beach with relaxed muscles, and goes directly to Southampton to train up in two weeks for a tennis tournament."

6. "No form of exercise that I know of that women ordinarily take has any influence upon the position of the womb."



14. "Athletics do not give displacements except where they already exist in a moderate degree. Then heavy work is apt to make them complete. A college champion had a moderate retroversion and made it complete. She is entirely well since operation. Can also work during menstruation. Another patient operated for retroversion rides to the hounds and does all kinds of active athletics. She began with out-of-door sports after having had three children, a lacerated perineum, a retroversion, and operation."

17. "Displacements not produced by athletics. If already slight retroversion it may become complete with violent work, or unsuitable exercise. District Attorney in a sister city testified that the opinion of experts was to the effect that any accident *per se* could not cause retroversion."

18. "Athletics do not cause displacements."

19. "Violent forms of folk-dancing objectionable."

#### SUMMARY ON DISPLACEMENTS.

Five out of twenty gynecologists believe that displacements can be caused by violent exercise especially during the menstrual period. Several others specify that if there exists already a slight retroversion, athletic exercise tends to make it complete. Several have specified that the girl who sets up pelvic trouble is the girl out of training, with soft relaxed muscles who suddenly goes into rigorous competitive games, or attempts stunts which she had accomplished with perfect safety when trained up to them. One physical and medical director refers to athletic work begun early as prophylactic treatment, and further that existing displacements lessen under suitable gymnastic work.

#### HOW DO ATHLETICS AFFECT CONVALESCENCE AND LACTATION?—

##### EXCERPTS FROM LETTERS AND INTERVIEWS.

8. "Do not do better."

11. "Convalesce better, nursing not better."

9. "Splendid convalescence, better nursing, better children."

1. "Splendid recoveries."

2. "Fine recoveries."

#### SUMMARY ON CONVALESCENCE AND LACTATION.

Ten out of twelve observers are more or less enthusiastic as to the effects of physical training in relation to convalescence after labor. Several testify that these women are better fitted

to nurse their babies. Two most reliable observers report that nursing is no better in these women. One writes that women who do hard daily work are often unable to nurse their babies.

Fifty years ago the pale, delicate girl was fashionable. A hearty appetite was a disgrace, outdoor sports were masculine, so our girls spent much time in doors in fancy work, crocheting, embroidering, dancing. Now they are off with a rush for the tennis court, the golf links, perhaps driving the motor car that takes them there. Girls with rosy cheeks and sparkling eyes, generous appetites and good circulation are now the popular type.

The change in the life of our people makes such a study as this of vital importance. Life has become so complex—the simple tastes, the vigorous life in the fields or about the house has given place to the life of the cities with the confinement of shops and offices, of halls of learning, the excitement of places of amusement, theatres, operas, of perpetual tea and bridge parties and so forth.

One of our best known obstetricians writes: "The great need of our women, especially in the so-called upper classes is muscular work. If some of them could become laboring women and earn their bread by "the sweat of their brow" as poor men and women do, we should have much less hysteria, neurasthenia, nervous prostration, heart-failure, dystocia, and insanity than we now do, and also a less number of useless abdominal surgical operations. If woman will not do any normal manual work, perhaps athletics is the next best thing."

The cultivation of out-of-door games and sports, of cross-country walking, would seem to be the surest and quickest means of our physical salvation. We must, however, have a clear understanding of the use and abuse of athletics in its relation to individuals—our watchword should be "moderation."

One of our best known physical educators recently wrote, "We have found that exercising with gymnasium apparatus has a tendency to stiffen the muscles, to render them hard and tense, whereas our aim is to develop suppleness and lightness . . . . We want to have our college girls not only strong and muscular, but we also want to develop suppleness, lightness, quickness and litheness. The most successful way to do this, it seems to me, is by wholesome outdoor sports, games, and dancing."

A university professor writes: "From the standpoint of therapeutics, most athletic games—inaccurate and wasteful of

time—do not compare with the accurate, formal movements of gymnastics.”

May I quote the words of an enthusiastic horsewoman as applicable to wise athletics:

“If I should be allowed to enumerate all the ailments of both mind and body that riding is good for, I fear my eulogy would exceed the most comprehensive of patent-medicine advertisements. Riding tends to bring the body to a normal healthy state; it is the secret of perpetual youth, for it keeps the body, the figure, and the heart young. In addition, it teaches self-control and decision, and develops the will power. In short, for a healthy life, strength and the pursuit—and, with a good horse, the capture of happiness, take riding”—athletics.

No paper such as this can be of value that does not have the hearty cooperation of a large number of trained observers of large experience. We do not value one opinion as conclusive, but the consensus of numbers. I take this opportunity to express my warmest thanks to those who have given such cordial and painstaking responses. I should appreciate any further data and suggestions which others may have to offer.

It is impossible to analyze these statistics with any degree of accuracy on account of the premises being so varied, but, in attempting such an analysis, we find, in general, the large majority approve of moderate athletics. This term, moderate athletics, again needs definition. We must create a standard, but the average physician is not yet sufficiently well posted along the lines of athletic training for girls to realize either the value or disadvantages of many particular forms of exercise. Moderate athletics with some would include, for example, running and vaulting, while others would rigorously exclude them. A few have laid emphasis on the early systematic training in carefully graded educational work, and perhaps the majority object to so-called violent work at any time. Some have expressed their appreciation of the value of a good foundation in early childhood, if upon it is to be built that most complex and noble structure a perfect woman.

The Japanese begin their jiu-jitsu with their girls at four or five years of age. Irving Hancock writes that in Japan the women are not weaker than men and in this country they have no right to be.

From the notes on the circus women we find that their training is begun, in many cases, in the earliest childhood. They are



carefully and systematically trained so that at puberty most of them do not find it necessary to make any break, but go steadily on without any apparent injury.

Let our little girls lead the same out-of-door, unconventional lives from early childhood as their small brothers, climbing, swimming, running, ball-playing, etc. This should continue without any distinction as to sex until puberty, and they will arrive at that first great epoch in their reproductive life well prepared for the changes which now take place. In preparatory and private schools their athletic work, games, gymnastics, etc., should be supervised by an intelligent physical educator, each girl having been carefully examined by a physician conversant with the scope of athletics and the effects of specified forms of exercise. More enthusiasm for the outdoor life for girls carries with it the advantages of sunlight and fresh air as well as of exercise.

With such graduated preliminary training a girl enters college well prepared for its athletic joys. A body well developed and under the good control made possible by years of active use ensures not only good physical endurance but makes intellectual work easier and adds zest to all the activities of life.

It goes without saying that the same preparatory training does not turn out hearts, lungs and muscles of the same caliber and while it tends toward nervous stability and poise the complexity of a girl's life is so great and original endowments so diverse, that we cannot expect equally good results in all individuals. A thorough medical examination should be made, and on the basis of the findings, her physical activities should be adjusted with continued wise supervision. The student should have the advantage of a thorough grounding in the physiological facts essential to her highest physical development, she should be fully aware of the inevitable penalties to be paid for carelessness, recklessness, and exercise too violent or stimulating for her individual organization. She should understand clearly what she may and may not do during the menstrual period.

One of the high excellences of physical education is the training of the judgment, self-control, the recognition by the young athlete of her powers and her limitations, the knowledge of the cause and effect of strain or other injury, and the avoidance of the conditions causing them.

While a rational amount of activity is most beneficial at the period, and often invaluable as a therapeutic agent in dysmenor-



rheas, and other pelvic disturbances, immoderate exercise, violent exercise, can be safely indulged in only by the exceptional few. High nervous tension during the menstrual period should be avoided.

Here would properly come up the whole question of inter-collegiate games. Those who have expressed themselves on that point are unanimously inclined to believe that they should be discouraged because it is impossible to suit the time of contests and preparatory training to the individual girl. The wild excitement of the meet itself, her loyalty to her college, the applause of the multitude, the intoxication of outstripping her competitors, all these cause many a girl to sacrifice what seems a problematical future evil to the present hour of triumph. She is swept away by the enthusiasm of the moment. The nervous strain in such contests is tremendous, and uses up more vital energy than most girls have to give. The fact that every now and then a college boy is carried off the football field or from a boat-race, a physical wreck, seems no justification for approving intercollegiate sports among girls where similar results may occur. The same strenuous objection cannot be made to interclass contests.

This is said in no didactic fashion, only with the desire to keep the matter agitated until definite conclusions are reached, and the medical profession doing its full duty in advising and in training our splendid army of American girls into the highest type of physical perfection possible for womanhood and motherhood.

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## PITUITARY EXTRACT IN INERTIA UTERI.\*

BY

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THE factor in labor over which we have the least control to-day is the power of the contractions of the uterus. Any contribution offering help in this particular should be welcome. Animal experimentation with animal extracts has given us a valuable aid to this end, in the form of an extract of the infundibular portion of the pituitary body.

*Anatomy.*—Briefly it will be recalled that the pituitary body situated at the base of the brain on the sphenoid bone is com-

\* Read before the New York Obstetrical Society. May 14, 1912

posed of an anterior lobe (the hypophysis), a posterior lobe (infundibular lobe), and a stalk connecting this with the floor of the third ventricle called the infundibulum. The two portions are of an entirely different construction. The anterior resembling a fetal thyroid (Bell) and the posterior consisting of a ground-work of ependyma and neuroglia cells and fibers containing islets of epithelial cells. It is the posterior portion and the infundibulum which contain the material with which we are interested.

H. H. Dale(1) in 1906, while experimenting with an extract of this portion, discovered that it would cause contraction of the uterus when injected intravenously into a rabbit. The action was very similar to that of ergot; and it was in a paper on ergot that attention was first called to this physiological effect of pituitary extract without any practical suggestions as to possible clinical uses. He called attention to the chemical fact that the so-called pressor properties of ergot are due to certain amines and that it is to these same amines that an extract of the infundibular portion of this gland owes its activity. These amines are probably derived from the islets of epithelium among the fibers of the infundibulum.

Blair Bell(2) on November 4, 1909, before the Liverpool Medical Institution, read the first clinical paper on the therapeutic value of the infundibular extract in shock, uterine atony, and intestinal paresis. He determined among other things that infundibular extract causes powerful contractions in the puerperal, pregnant, and menstruating uterus and that it raises the blood-pressure. He cited two cases of Cesarean section with the striking results of the blanched ball of a uterus after injection with pituitary extract. He further noted its success in cases of postpartum hemorrhage from atonic uterus. He opined that infundibular extract would in the future be used to produce contractions of the uterus in many serious obstetric complications and difficulties but it was his opinion that it ought but rarely to be given before labor.

Aarons(3) in September, 1910, before the Fifth International Congress of Obstetrics and Gynecology, held in St. Petersburg, read a paper on the use of pituitary extract in obstetrics and gynecology. He found that the uterus contracts better and more quickly in normal labor, than when ergot is used. He cited seventy cases with eleven in detail, including instances of postpartum hemorrhage, intestinal paresis, and retention of urine.

The German obstetricians were quick to grasp the value of this medicament and no less than seventeen articles have appeared in the German literature in the last year and a half, all favorable in their findings, in suitable cases.

Hofbauer(4) of the Breslau Frauenklinik reported sixty-six cases. He found that results depended on the quality of the preparations and the method of injection employed. Old preparations were not as effective. Alcohol contaminated the efficacy. Intramuscular injection should always be practised. No local disturbance was observed. His dosage was 0.5 to 3 grams. No toxicity was noted. For urinary retention he found 0.5 gram. sufficient. There were no kidney complications. He did not recommend its use in nephritis or myocardial disease. In three cases pains gradually became less strong, requiring three injections. It was most effective in the second stage, here his results he characterized as brilliant even in a somewhat contracted pelvis. He did not obtain so good effects in postpartum hemorrhage for which the drug was first recommended.

Ross(5) incited by Hofbauer's results confirmed them. He does not see how pituitrin can be excluded from obstetrical therapeutics, saving time, needless forceps, and physical exhaustion both for the patient and physician. He found it useful in postpartum hemorrhage from atony of the uterus.

Gottfried(6) reported some brilliant results. He mentioned without going into detail five cases in which an injection of pituitrin proved of very little if any advantage.

Kroemer(7) in two cases of Cesarean found it diminished the amount of bleeding.

Pfeifer(8) believes that if the kidney condition is insufficient, pituitrin should not be used, based on experience with a case of eclampsia.

Stern(9) had some slight success with it in three cases for inducing labor, giving one injection a day for four days, in one case, with bag introduction, in the others, alone.

Bondy(10) in ten cases, reported positive results in eight, doubtful in one, and one a total failure. He considers it of great value in prolonged labor and loss of labor pains. He charted eight cases in which the length of labor before the use of pituitrin averaged thirty-six hours and after its use twenty-eight minutes. The cases all being prolonged in the first stage with membranes ruptured and four fingers dilated.

Schmidt(11) used a combination of pantopon and pituitrin in

118 cases of labor at the clinic in Prague. He concluded concerning pituitrin; that it is the best of all the drugs for the treatment of postpartum hemorrhage; it is superior to ergot in that it may be administered before the separation of the placenta. It is the only infallible means of producing contraction in inertia uteri. Rapid labor and little hemorrhage are the results of its administration.

Frees(12) believes in the reliability of pituitrin for arousing and increasing the force and frequency of the contractions of the uterus in labor. While it should not be used in any other obstacle to the conclusion of labor than inertia, in slight degrees of pelvic contraction, it has been of great assistance in causing the engagement of the head.

Vogt(13) at the Dresden Frauenklinik has made use of pituitrin in obstetrics with excellent results. He believes that pituitrin acts promptly and energetically in the expulsive period; it makes normal labor more rapid, prevents secondary weakening of the contractions, and assists in the delivery in cases of contracted pelvis. It acts most strongly in the expulsive period but acts also after the child has been born, by assisting the expulsion of the placenta. He believes that in pituitrin we have the ideal means of increasing the contractions of labor. He saw no tetanic contraction of the uterus.

Hahl(14) injected pituitrin directly into the uterine muscle in two cases of Cesarean. He reported its use in thirty-four cases at the clinic at Helsingfors, four of which were studied with the apparatus of Westenmark. He found that in some cases it had no effect but in others excited regular and powerful pains which remained of constant strength for ninety-six minutes and then weakened. In two cases the pains became shorter but stronger, the intervals of less duration and the intrauterine pressure higher, more tetanic in character. He advises as an ordinary dose 1 gram, repeated if necessary.

Parisot and Spire(15) are the only French reporters to date that I could find. Their results were not conclusive since they used an extract from the whole gland. They had some success in four cases.

My research shows no discussion of the use of this drug before any representative obstetric body in this country. This fact in association with the happy results reported from abroad particularly in Germany and England and my own experience of the last winter's work at my clinics at the Jewish and Methodist hospitals



and in private leads me to offer this subject for your discussion, that we may go on record for or against pituitrin.

I have used pituitrin in sixty-four selected cases from the last 525 cases coming under observation since September, 1911. I have come to the belief that it is a potent agent to cause uterine contractions under certain conditions. Sometimes it fails completely just why I do not know; but its effect when properly administered is so satisfactory that it now occupies a definite place in my obstetric therapeutics. In my judgment it has no place in normal labor. Its chief indications in obstetrics are in inertia uteri, in postpartum hemorrhage, in Cesarean section, and in preventing and treating shock.

We have never seen any unhappy results in its use either to mother or child. Cost is an objection which, however, is not out of proportion to the good results obtained.

*Preparations Used.*—We have employed the vaporoles of pituitary (infundibular) extract of Burroughs Wellcome & Co. each cubic centimeter of which represents 0.2 grams of fresh posterior lobe of the pituitary body and pituitrin of Parke, Davis and Co. in ampules containing 1 c.c. which represents 0.1 gram of fresh pituitary gland (infundibular portion). The latter preparation is also put up in ounce bottles. It has seemed to us that we have not had quite so satisfactory results with this as with the ampules and vaporoles. It has been stated by some writers that the preparation becomes colored and deteriorates with age and this may be the reason why the bulk preparation fails to give as good results.

*Dosage.*—Pituitrin should always be given hypodermatically and intramuscularly. Digestive juices destroy its activity. The initial dose was first recommended at 0.1 gram or 0.2 grams, but the German workers have come to use far larger doses, some as high as 1 gram at the initial dose. No toxicity has been recorded at any dosage; but there is an idiosyncrasy as to the amount necessary to obtain the effect. We have come to use 0.4 grams (4 c.c. of pituitrin P. D.) as the initial dose repeated every twenty minutes for three doses if necessary when if no results are obtained, the drug is forsaken.

*Effects.*—Objection has been made to pituitrin because it raises the blood-pressure. Our observations, which are in accord with others, is that its effect on the blood-pressure in labor, is not so great as at first asserted. We have carefully observed the blood pressure in thirty cases, before its administration, just after, one-

half hour later, and at a further interval of two hours. The highest elevation of the blood-pressure was twenty points, and the average eight points. The lower the blood-pressure in the beginning the greater the elevation in consequence of the use of the drug. This pressure was continued during the two hours. The second dose of pituitrin did not raise the blood-pressure perceptibly more than the initial dose. So we have come to believe that its effect on the blood-pressure can safely be disregarded, although we would not venture to use it when the blood-pressure is over 150 to begin with, when any considerable lesion of the heart or the kidneys is present. We employed it in a case of bronchopneumonia for the purpose of aiding an inertia uteri toward the end of the first stage in dosage of 0.4 grams repeated in twenty minutes with the desired effect of increasing the force and frequency of the labor pains, in one hour completing the dilatation and forcing the head to the perineum for an easy forceps. No bad effect was produced to the patient or child. Her pneumonia went on in its usual course. She died in six days. Her blood-pressure was elevated fifteen points after the first injection from 125 to 140 and remained at 140 after the second injection for two hours.

*Effects on the Uterus.*—In early pregnancy, it would seem that little need be feared from the pernicious use of pituitrin *per se* as an abortifacient. In the early months of pregnancy it will cause uterine contractions but no expulsion of the contents of the uterus. This observation is in accord with others. As an example, I will cite from my own experience the case of a woman with absolute indication for Cesarean who had one child by abdominal route and who declined to assume the responsibility for a second delivery, pregnant two months. Pituitrin was injected in an attempt to induce abortion in full dosage 4 c.c. repeated three times on three successive days, without any effect to cause the expulsion of the contents of the uterus.

*In the Induction of Labor.*—During the middle period of pregnancy few statistics are available of the use of pituitrin *per se* but its use after the introduction of a bag seems to show that it hastens the dilatation materially. In cases which have gone to full term or over time some reporters have had success, but this is not in accord with our experience. In ten women of this class, I made three repeated injections of 4 c.c. of pituitrin, three days in succession and in no case did labor come on within three days of the last injection.

*In the First Stage of Labor.*—The early part of the first stage of labor, before shortening and at least three fingers dilatation are present is no time, in my judgment, for the use of pituitrin, except where it has been necessary to introduce a bag, or to do Braxton-Hicks version for placenta previa. In the ordinary case of delayed first stage with nagging pains, quieting efforts and time are far better treatment than pituitrin; but when the cervix has shortened and dilated to three fingers or over and advance with engagement does not occur from simple ineffectiveness of the labor pains here is one of the times when the effect of this drug is most striking and satisfactory. Within five minutes from the time of the first or second injection the character of the pains is entirely changed. They become much stronger, of longer duration, and nearer together and continue for a varying time of about two hours. May I cite one case as an example: A primipara thirty-five years old, stout and flaccid in musculature had been thirty hours in labor with weak inefficient contractions when I was called in consultation. She was tired, with a dry tongue, and a pulse of 130. The membranes were ruptured six hours (artificially by the doctor in the hope of increasing the efficiency of the pains). The fetal heart was very irritable flying up to 200 during the contractions. The cervix was well thinned out, three fingers dilated. The head L. O. A., dipping into the brim manifested no great disproportion, not a very good proposition to our mind for either mother or child to do an immediate forceps. Pituitrin 4 c.c. was injected into the thigh. In seven minutes the entire picture changed, the pains were lengthened and strengthened, and in one hour she had pushed the head to the pelvic floor for the simplest kind of a forceps, after manual dilatation of the vulva. This case represents practically the same features as we have observed in eighteen cases with most brilliant results.

*In the Second Stage of Labor.*—When just a little more vis a tergo is needed to mold a head through a pelvis or the uterus is tiring from its efforts against a slight degree of disproportion, the results are equally satisfactory to those noted above. Our experience has been even more striking when we have employed 1-20 grain of strychnine hypodermically at the same time as the pituitrin, and in such indications as the above we believe this to be the ideal combination. The effect has been more marked in multiparæ than primiparæ.

*In the Third Stage of Labor.*—When no inertia is present,

pituitrin causes an earlier separation and quicker expulsion of the placenta, but I do not incline to employ it as a routine procedure. Less hemorrhage and better restitution are obtained I think by the quiescent period of twenty minutes and Credé and ergot. When inertia uteri is present and profuse bleeding therefrom occurs, pituitrin is illogical alone. It causes intermittent contractions of the uterus. A more tonic pressor is needed and ergot hypodermically in large doses still has the first claim. However pituitrin supplies something which ergot does not in stimulating prompt contraction, in most positively and strikingly preventing the shock accompanying postpartum hemorrhage and in aiding the involution of such an atonic uterus. Where pituitrin has been employed earlier in labor with inertia, it is to be remembered that its effect is temporary and unless it is repeated in the third stage grave hemorrhage may occur.

*In the Puerperium.*—When pituitrin has been used during the later part of the labor, it has seemed to us that the involution is more rapid. We have observed no case of retention of urine where pituitrin was used in the labor, but we have not used it to relieve retention although aware of its success as an agent to this end in some hands.

*In Cesarean Section.*—We have exhibited it in seven cases, six with complete and brilliant success and once without any effect. We deem it wise to give ergotole, 30 minims hypodermically, at the beginning of the operation, and do not give the pituitrin until the sutures are placed in the uterus because of an experience in one case in which contraction was so prompt that the sutures in the uterus could not be placed accurately and later a considerable hemorrhage occurred into the abdomen, beneath the peritoneum over the uterus, forming a hematoma which was ultimately entirely absorbed.

It is my regret that time does not allow of a more detailed analysis of my series of cases.

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## SOME OBSERVATIONS ON PRIMARY UTERINE INERTIA.\*

BY

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UTERINE inertia is primary or nonobstructive, and secondary or obstructive. In primary inertia the uterine contractions are from the first inefficient in themselves, and labor is delayed simply for this reason and not from obstruction to the birth of the fetus.

In secondary inertia the contractions may be satisfactory at first, but because of *obstruction* they become ineffectual from exhaustion.

One is the lack of uterine effort. The other is uterine exhaustion from obstruction.

Lack of uterine effort and obstruction may exist together. Obstruction slight in itself associated with poor uterine effort may prevent normal termination of labor. While with marked uterine obstruction from pelvis or fetus, the uterine contractions are often for a time feeble, not from real weakness, but because the presenting part is high and contractions are not stimulated.

Primary inertia includes those cases of delayed labor due *primarily* to poor uterine effort. Secondary inertia includes those cases due *primarily* to obstruction.

I wish to consider here only primary or nonobstructive uterine inertia. This may be defined as "delayed labor caused primarily by inefficient uterine contractions, in the absence of serious obstruction to delivery."

One of the most puzzling complications of labor is primary uterine inertia. There are two general methods of treating it. One is the attempt to stimulate the inert uterus to action, and

\* Read before the New York Obstetrical Society, May 14, 1912.

thus at once to end labor. The other is to quiet the uterus as far as possible and to wait, in the hope that by rest the inertia may disappear, and at a later time, labor may be more nearly normal.

I have met with eighteen cases of primary uterine inertia in 175 consecutive labors in private patients. A short study of these with special reference to these two methods of treatment may be of interest to the Society.

The frequency was a trifle over one in ten. This does not include all cases in which labor pains were weak, but only those cases in which the pains were so weak as to be a serious problem. In thirteen the pains vanished entirely for a time, and one had no pains at all.

Of the eighteen cases of inertia only three started spontaneously. In fourteen labor was induced artificially by bags, and in one an attempted induction by bougie failed. Delivery was subsequently affected by forceps with no labor pains.

Induction was undertaken in thirteen to promote easy labor before the fetus should become too large; in two it was induced for slight albuminuria.

At the time of labor all were within two weeks of term, and thirteen at or beyond term.

Twelve women were multigravidæ, and six were primigravidæ.

Eleven were over thirty years of age, seven were under thirty years, and three were under twenty-five years of age.

In none of the eighteen cases was there serious obstruction from the pelvis or position of the fetus, to account for the inertia. All the pelves were normal by external and internal examination, two with slight prominence of the sacral promontory, but not sufficient to cause obstruction. In none was there marked disproportion between the sizes of the fetus and the pelvis.

The cause of the inertia seemed to be previous distention of the uterus in five; age with many years since childbirth in two; two were elderly primigravidæ; three delicate or flabby women, and one woman was pregnant for the third time in three years. In one a very slight projection of the sacral promontory seemed partly responsible; and in four no cause could be discovered, except in the mental attitude of the patients.

The actual time of labor was not long in any case, though from the beginning to the end with the periods of no pains, labor was often protracted. In nine the total time of labor was over

twenty-four hours, the longest was forty-five and one-fourth hours, the shortest had no labor at all.

Three of the cases were delivered normally; five by high forceps; five by medium forceps; and five by version, four of these latter because of intercurrent complications.

There was no maternal mortality, but there were five stillbirths, and one infant death, a total infant mortality of six or 33  $\frac{1}{3}$  per cent. Two of the stillbirths, however, were due to prolapsed cords.

Only one of the patients had anything approaching a post-partum hemorrhage. She lost about 15 ounces of blood. However, in six the uterine cavity was packed with gauze immediately, as a precautionary measure.

In four inertia in the third stage necessitated manual extraction of the placenta; and in two others, part of the membranes were so extracted.

Four of the women had temperatures of 100.6° F. or over following delivery; one a pyelitis appearing on the fourteenth day; one a reactionary temperature of 101° F. within the first twenty-four hours only; and two temperatures of 101° F. and 102° F. respectively, each on the third day, but disappearing on the fourth.

The results obtained in the treatment of these cases of inertia varied so widely with the methods employed that I wish especially to call attention to this fact.

In the first five cases, when complete inertia occurred, efforts were made to stimulate the uterus to action and to finish the labor at one session. The results were so discouraging that in all the following cases this method of treatment was discarded, and was only used when absolutely required. Rather a waiting policy was adopted, and if the membranes were unruptured and the inertia was complete, no effort was made to stimulate "pains," but the patient was left alone and labor was allowed to start spontaneously. This happened in every case except one within four days. The results by this means were extremely good, in marked contrast to the poor results by the former method.

In speaking of these five cases treated by the "stimulating" method, if we may so describe it, I shall omit details as far as possible, and to this end I will mention several features common to all which need not be separately repeated. In all labor was induced to bring about an easy delivery. In all obstruction was absent from pelvis, or faulty position or size of fetus. In

all at the time of induction the cervix was short and soft admitting two or three fingers, with the fetal head at the brim in the L. O. A. or R. O. A. position.

The first case was so easy as to be deceptive. A duogravida, twenty-nine years old, had four years previously lost her first child, fabulously large, after a harrowing instrumental delivery.

Labor was induced two weeks before term by a No. 3 modified Champetier de Ribes bag. The bag was expelled after twelve hours, leaving the cervix dilated four fingers. Pains ceased entirely, wherefore the vagina was packed tightly with gauze, but this did not make the pains reappear. After eleven hours the packing was removed and conditions were found unchanged. The membranes were artificially ruptured. Still no pains appeared. Consequently, under anesthesia the cervix was dilated manually and forceps were applied to the head at the brim. With almost the first traction the patient was delivered safely of a 6 1/2 pound child.

The next case was disastrous. Mrs. W., a nervous duogravida, thirty-three years old, had nine years before given birth naturally to a 6 1/2 pound baby.

When at term a No. 3 bag was inserted. No perceptible pains resulted, but after twenty-four hours the bag was expelled, leaving the cervix dilated four fingers. A bougie was introduced with vaginal packing. A slight oozing indicated that the membranes were punctured, but no pains were noticed. Twelve hours later the bougie and packing were taken out. Conditions were unchanged. Under anesthesia the cervix was dilated manually and forceps applied to the head at the brim. The operation was most difficult, and after one hour of intermittent traction the patient was delivered of an 8 pound infant, who died on the third day, from cerebral and general hemorrhages.

The third patient, Mrs. M., was a neurotic elderly looking duogravida, thirty-six years old. Eight years before she had lost a seven months fetus in a dry labor.

When at term labor was induced by a No. 3 bag. All day the patient was only uncomfortable, but finally expelled the bag with severe "pains" nine hours after its introduction. The cervix then admitted four fingers, and with each pain the membranes bulged so strongly that it appeared inevitable they must soon burst. Consequently they were artificially ruptured. A normal termination of labor seemed near, but with the rupture of the membranes, the unexpected happened and all "pains" stopped. Nothing ever started them again. At first the patient was allowed to rest and sleep, then every effort was made to start the "pains," larger bags, Pomeroy bags, bougie, vaginal packing, walking, and strychnine. After twenty-four hours the patient was delivered with high forceps, at my request, by Dr. Cragin. The cervix had become so resilient that it had to be cut. After a most difficult operation lasting nearly an hour, a stillborn fetus weighing 7 pounds 2 ounces was delivered.



Mrs. R., was a delicate little duogravida thirty-six years old, with a longing for a large family. Two years before she had lost her first-born, six days after birth from a high forceps delivery. Labor was induced at term by a No. 3 bag. This was expelled in seven hours with weak "pains" which ceased entirely on expulsion of the bag. A No. 4 bag was introduced and was expelled in about the same time. Again the "pains" stopped. Examination showed a rim of cervix, with the head still at the brim.

Two courses were now open: To leave the patient alone, and if labor did not start satisfactorily, to deliver by Cesarean section; or to rupture the membranes artificially, in the hope that thus sufficient contractions would be stimulated to enable delivery to take place. This latter course was adopted. Weak pains developed but were of slight value, and forceps had to be resorted to. These failed as the head was high, and a low implantation of the placenta caused profuse bleeding whenever the right blade was introduced. Version and breech extraction were performed, a stillborn fetus of 7 pounds 2 ounces resulting. (The cause of the fetal death is not quite clear, as the delivery was short, and comparatively easy; it was probably the handling of the fetus, combined with the bleeding from the placenta.)

This patient was delivered satisfactorily by Cesarean section a year later in the hands of Dr. Cragin, after practically total inertia again.

The last case, Mrs. R. M., a three gravida, thirty-seven years old, had a labor similar to that of the preceding patient. She was pregnant for the third time in three years. In her first labor an 8 pound child was delivered safely by medium forceps. In her second labor an induction two weeks before term resulted in a normal delivery. Wherefore, in the third pregnancy, two weeks from term labor was induced. A No. 3 bag was expelled in six hours, "pains" ceasing entirely. A No. 4 bag was pulled through with slight traction in three hours. "Pains" again ceased. The cervix was found fully dilated except for a rim; the head was still at the brim. The membranes were artificially ruptured, but no pains whatever resulted. High forceps were finally applied, but failed to advance the head materially, so a version was done. The head stuck in the pelvis long and firmly enough to cause the loss of a fetus weighing nearly 7 pounds.

Thus of these five cases treated by the stimulating method, four of the five fetuses were lost. It is natural after taking the wrong turning at the cross-roads, to think how easy it would have been to take the other. Still in the light of results obtained by the waiting method, hereafter described, it seems that better results might have been obtained in the first five cases. If, when inertia was plainly so marked, efforts to stimulate the uterus had not been persisted in, and the patients had been

left alone, it is probable that in some of these cases, at least, pains would have started spontaneously; and with moderate contractions to mould the fetal heads, any or all of these fetuses might have been delivered safely. If pains had not started in a reasonable time, a second attempt to start them, after the patient was well rested, might have succeeded. If not, Cesarean section could always have been resorted to.

It is to be especially noted that in all these cases of complete inertia the membranes were artificially ruptured before the cervix was entirely obliterated, and while the head was still at the brim.

In contrast to the above five cases treated by the "stimulating" method, I wish to mention the result of nine cases of complete inertia treated by a waiting method.

In the four remaining cases of the series of eighteen, an early spontaneous rupture of the membranes, or the persistence of weak pains without any stopping, allowed of only one method of treatment, the termination of labor as soon as feasible. These are of no particular interest and will not be further discussed.

A brief description of some of these nine cases will suffice to illustrate the methods and results.

I may say that in none of these cases was there serious obstruction from the pelvis, size or position of the fetus. In all but one labor was induced. In all at the time of induction, the cervix was soft and admitted two or more fingers; in all the head was at the brim, except in one, where it was in mid-pelvis; and in all the position was L. O. A. or R. O. A. except in one when it was R. O. P. Moreover, the inertia which appeared was apparently just as marked as that seen in the five previous cases.

Mrs. G. C., a primigravida, twenty-three years old, went into active labor at eight months, in the country. After having regular labor pains for five hours, the patient heard the carriage with doctor and nurse drive up to the door. Immediately all "pains" ceased. The cervix was found dilated four fingers, thinned out, and the membranes intact. The cervix was stretched with the fingers, but the patient slept all night. The next day she walked all over the farm, climbed hills, went up and down stairs, but no pains developed. The following day she came to the city. Three weeks later a sudden gush of fluid made the patient think her membranes had ruptured. Examination showed the cervix entirely obliterated. Artificial rupture of the membranes was followed by expulsive labor pains, and normal birth of a 7 pound child in an hour.

Mrs. A. W., a duogravida, thirty-two years old, one week past

term, had labor induced by a No. 3 bag. The bag was expelled in six hours leaving the cervix dilated four fingers. No further pains resulted, in spite of the introduction of a bougie and vaginal packing. After these had been in place for twelve hours they were removed, thirty-six hours from the first introduction of the bag. The membranes were still intact, and the cervix admitted four fingers. The patient was left alone, and told that labor would not start for a day or two. One hour later, very strong "pains" started spontaneously, and continued till the membranes ruptured, also spontaneously, and the head was crowded down well into the pelvis, when labor was terminated by an easy forceps operation. The child weighed 7 pounds 11 ounces.

The next case was practically the same. An attempt was made to induce labor in a primigravida, twenty-six years old, two weeks past term. The bag was in the cervix twenty-four hours with practically no "pains." At the end of that time, as the bag was still in place and the cervix was apparently unchanged, the stem of the bag was cut, and the collapsed bag was removed. Further attempts were abandoned. About one hour later strong, frequent "pains" started spontaneously, and seven hours after, a 6 pound 2 ounce baby was born naturally, the membranes rupturing spontaneously a short time before birth.

In both of these cases the inertia seemed stubborn, and yet when attempts to overcome it were abandoned, labor started spontaneously within an hour. The reason for this is not clear, unless the mental attitude of the patient was responsible.

The other cases were similar, except that labor pains started again spontaneously, not in one hour, but after several days.

Mrs. J. S., a duogravida twenty-eight years old, developed slight albuminuria and vomiting at term. Labor was induced by a No. 3 bag which was expelled in a few hours, leaving the cervix four fingers dilated. After this no "pains" developed, in spite of the introduction of a bougie and vaginal packing. These were removed in twelve hours, and as the membranes were still unruptured and the vomiting had stopped, the patient was left alone. Four days later, labor started spontaneously and seven hours after resulted in the normal birth of a baby weighing 8 pounds 13 ounces.

Mrs. G. E. C., a thirty-five-year-old duogravida, a week before term, had labor induced by a No. 3 bag which was expelled in a few hours with rather weak pains. These then stopped. The cervix admitted four fingers, the membranes were intact, and the head was at the brim. All further attempts were abandoned. Two days later labor started after a dose of castor oil, and progressed until the head was well down in the pelvis, when a 7 1/2 pound infant was safely delivered by an easy forceps operation.

The remaining cases were similar to those just quoted. After bags had been expelled through the cervices, the pains ceased with or without further stimulus of bougies. As the membranes were intact, no further efforts were made to stimulate the uterus. In each case except one, after four days of entire rest, labor started spontaneously, with no suggestion this time of inertia. The one case in which labor did not start spontaneously might or might not have done so later, but as the head was well down in the pelvis, with the cervix admitting four fingers, after four days of waiting, delivery was accomplished safely with forceps without labor pains.

These nine cases show, I think, the advantage of waiting, instead of persisting in attempts to whip into action an inert uterus.

Of the nine cases, eight fetuses were saved. One was lost because of a prolapsed cord.

In every case except one, labor finally started again spontaneously (one after three weeks, two within one hour, one within two days, and four within four days). After so starting the pains were satisfactory, so much so, that three had normal deliveries, and in the others sufficient progress was made to permit of easy artificial deliveries.

It is to be especially noted that the membranes were not ruptured artificially except in two cases, in one of which the cervix was entirely obliterated, and in the other the head was well below the brim of the pelvis.

It seems safe to infer that the inertia in these nine cases was as persistent as in the five previously described, and that continued attempts to overcome it, especially rupturing of the membranes early, would have led to similarly poor results.

*Conclusions.*—These cases emphasize certain points.

Primary inertia is especially seen in women over twenty-five years of age, slightly more often in women over thirty years of age.

While due to many causes, it is frequently due only to mental conditions, is often temporary, and at a later time may not exist. This is especially true of labor artificially induced.

The danger of rupturing the membranes artificially in primary inertia, before the cervix is fully dilated, or before the head is well within the brim, cannot be too strongly emphasized.

Primary inertia is a most trying complication, but when proper treatment can be followed, the results are favorable.



When proper treatment cannot be followed, especially where there is a desire for haste, the results are bad.

By the hurrying method, four out of five fetuses were lost—80 per cent. By the waiting method one out of nine was lost—11 per cent., or with the whole remaining thirteen, two out of thirteen—15 per cent. The only fetuses lost by the waiting method, were from prolapsed cords.

*Treatment.*—When from previous history, or appearance of the patient, inertia is apprehended, remedies to build up the patient's general health should be used, long before the onset of labor. Strychnine thus used, as advocated by Edgar, may be beneficial. But attempts to induce labor should not be made, unless indication is urgent. If labor must be induced, the dilating bag is better than the bougie, for it is less likely to cause rupture of the membranes.

In primary inertia do not rupture the membranes artificially, unless the cervix is entirely obliterated, or the head is well within the brim, for if inertia still persists, delivery must be accomplished entirely by the obstetrician, through a cervix not fully dilated, or with the fetal head not well moulded. It is generally safer to let the membranes rupture spontaneously.

The treatment of primary inertia therefore depends largely upon whether the membranes are intact or not. When intact, waiting does no harm, and is usually the best treatment. If necessary, the uterus should be quieted with morphine or chloral. Trying to hurry the labor, or to whip the uterus to action, is often useless and dangerous, and in the absence of urgent indication should not be done. It is better to wait for labor to start again spontaneously. When the membranes are already ruptured, waiting for any length of time (over 12 or 24 hours) is usually dangerous, especially to the fetus, and active measures should be taken to end labor.

Distinguish carefully between primary and secondary inertia, for the treatment is very different. In secondary inertia there is always some cause outside of the uterine muscle. This should be excluded, and no diagnosis of primary inertia should be made if such a cause be present.

Primary inertia is most frequently seen and is of chief importance in the first stage of labor. It gives relatively little concern in the second and third stage.

There does not seem to be marked tendency to postpartum hemorrhage after primary inertia, but this should be guarded

## SUMMARY OF EIGHTEEN CASES OF PRIMARY UTERINE INERTIA.

No.	At term	Age yrs	Para	Pelvis	Reason for induction	Method	Cause of Inertia	Length of labor	Method delivery	Uterine tamponade	Hemorrhage (estimated)	Temperature after labor	Petus
													Weight Lived died (or still born)
1	* 2 wks	29	ii	I J M	E.L.	Bag.	Previous dis- tention uterus; childbirth.	24h., 1 m.	Forceps, me- dium.		5 oz.		11 1/2 oz Lived.
2	Term	33	ii	N	E.L.	Bag.	Age 8 yrs since childbirth.	47h., 45m.	Forceps, high.	Tamponade	2 oz		8 Died 3d day, cere- bral hem- orrhage. Stillborn.
3	Term....	36	ii	N	E.L.	Bag.	Age 8 yrs since childbirth.	36h., 45m.	Forceps, high.	Tamponade	10 oz.	Psychitis 14th day.	7 2 Stillborn.
4	Term..	36	ii	N (minor outlet)	E.L.	Bag.	Previous dis- tention of uterus.	28h., 29m.	Version, lat. placenta previa.	Tamponade	12 oz.		7 2 Stillborn.
5	2 wks	37	iii	N	E.L.	Bag.	Third preg- nancy in 4 yrs	27h. ....	Version.	Tamponade	6 oz		7 Stillborn
6	2 wks	23	i	N	Suotane- ous labor		Not known menstr (2)	4h., 30m	Normal		6 oz.	101° F 3d day only	7 Lived.
7	1 wk. 4	32	ii	N	E.L.	Bag.	Delicate wo- man	13h., 45m.	Forceps, high.		10 oz.		7 1 1/2 Lived.
8	Term.	26	i	N	E.L.	Bag.	Not known menstr (2)	29h., 30m.	Normal		4 oz		6 2 Lived.
9	Term.	28	ii	N	Alluminum fil.	Bag.	Delicate (2)	7h., 30m.	Normal		10 oz.		8 1 1/2 Lived.
10	Term	35	ii	N	E.L.	Bag.	Not known menstr	5h., 40m.	Forceps, me- dium.		10 oz		7 10 Lived.
11	Term	39	ii....	N	E.L.	Bag.	Previous dis- tention uterus	18h., 20m.	Version	Tamponade	10 oz.	102° F 3d day only.	9 7 Lived.
12	Term	28	i	N	E.L.	Bougie	Not known.	No labor	Forceps, me- dium.		6 oz		6 1 1/2 Lived.
13	Term	29	ii.	J.M. (oro monitory)	E.L.	Bag.	Slight promi- nary.	10h., 30m.	Version, pro- lapsed cord.		6 oz	101° F, 1st 24 hr. only.	9 4 Stillborn (prolapsed cord)
14	1 wk	33	i	N	Alluminum fil.	Bag.	Elderly primi- para.	10h., 5m.	Forceps, me- dium.		7 oz		6 8 Lived....
15	Term.	36	iii	N	E.L.	Bag.	Previous dis- tention uterus.	17h., 50m.	Forceps, high.		6 oz.		8 2 Lived.
16	2 wks. +	41	i	J.M.	Suotane- ous labor.		Elderly primi- para.	22h. ....	Version, (pro- lapsed cord.)		6 oz.		1 1/2 Stillborn (prolapsed cord)
17	Term....	24	i	N	Suotane- ous labor		Delicate wo- man.	45h., 15m.	Forceps, me- dium.	Tamponade	15 oz.		6 9 Lived....
18	- 2 wks.	33	ii.	J.M.	E.L.	Bag.	Previous dis- tention uterus.	28h., 15m.	Forceps, high.		10 oz		7 4 Lived....

\* means before, + means after.

Individual indications cannot be given for lack of space.

† J.M. means justmajor, N. means normal.

‡ E.L. means to promote easy labor, before fetus too large.

against. Large doses of ergot are useful at the end of labor, and if the uterus does not contract, packing prevents hemorrhage.

Cesarean section has a place in primary uterine inertia, and should be seriously considered even in the absence of obstruction. It is absolutely safe for the fetus, and is often safer for the mother than a hard forceps operation or a breech extraction.

There is great need of a drug which will stimulate regular uterine contractions in primary inertia. Strychnine takes too long to act. Quinine is of little use. Alcohol is only occasionally efficacious. Ergot is dangerous, and should not be used till after labor. Pituitary extract offers hope.

43 WEST FIFTIETH STREET.

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## REPORT OF A CASE OF STREPTOCOCCEMIA DUE TO STREPTOCOCCIC INFECTION OF A SUBMUCOUS FIBROID.\*

BY

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MRS. W., a patient of Dr. Chas. Schram, was admitted into the Private Pavilion of Mt. Sinai Hospital on the night of March 23, 1912. I was asked to see her the next morning. The history of the present illness was that, in the morning of March 23, the patient was suddenly seized with a severe chill followed by a temperature of 105 and pulse 120. There was no pain anywhere. The patient felt very weak and looked ill. Of her previous history, it was known she had had fibroid growths in the uterus for a number of years and, three years before, had been curetted in Munich for uterine hemorrhage. For some months there had been cessation of menstruation, but on March 16, quite profuse bleeding had set in, for which Dr. Schram had tightly packed the vagina. The packing was removed at the end of twenty-four hours, a vaginal douche given and the packing reapplied. This was repeated for three days, when the bleeding ceased. No instrumentation of the interior of the uterus had been resorted to. The patient was fifty-six years of age, married thirty years, never pregnant. She had been under the constant care and supervision of Dr. E. Gruening for over thirty years, for cholesteatoma in the right ear. Dr. Gruening would find it necessary to remove cholesteatomatous masses from the canal from time to time, but at no time had there been any purulent discharge from, nor inflammation of, the middle ear. When the present tempera-

\* Presented to the New York Obstetrical Society, May 14, 1912.

ture set in, the family physician naturally assumed that this might be an expression of the lighting up of an acute process in the ear. Accordingly, Dr. Gruening was asked to see the patient, who, after a careful and thorough examination of the ear, stated he could find nothing to explain the chill and fever. The patient had also been seen by one of our most prominent gynecologists. He was called into consultation that evening and, after a pelvic examination, expressed the opinion that there was nothing in the pelvis to cause her present illness and inferred that the trouble must be in the ear. Upon this the patient was admitted into Mt. Sinai Hospital for the purpose of exploring the lateral sinus. But before proceeding with this, further counsel was sought. Dr. F. Whiting and myself were asked to see the case. I found when making a digital examination that considerable seropurulent discharge escaped from the vagina. The uterus was irregularly enlarged to the size of the gravid organ at eight weeks and presenting several fibroid nodules, one of which, the size of a small marble, was presenting in the cervical canal. The uterus was moderately tender. On ocular inspection, the fibroid in the cervix had a deep reddish color. The temperature was 105.6, pulse 130. Blood count, w.b.c. 24,400, polynuclear 88 per cent., large lymphocytes 7 per cent., small lymphocytes 4 per cent., basophiles 1 per cent. After hearing the positive assertions of both Drs. Gruening and Whiting, that they could not find on the most careful examination any sign, subjective or objective, in the ear of an acute mastoiditis or sinus thrombosis, I expressed the opinion that some changes had probably taken place in the submucous fibroids, giving rise to her present symptoms, although, I added, I could not recall a single instance where degeneration or sloughing of a submucous fibroid gave rise to such a serious illness, unless it was postabortive or postpartum. I advised an immediate hysterectomy. The operation was performed by me at 3 P. M. on that day. The only feature worthy of note during the operation was that when cutting through, after ligation of the uterine vessels, on the right side, a few drops of thick pus escaped. The patient withstood the operation very well. She had a fairly good night, the temperature fell to 103.2 and pulse to 118, but in the morning the temperature began to rise and at noon reached 106.4, pulse 140.

A blood culture was taken on the patient's admission, this was negative eighteen hours later (at the time of the operation), but in the morning of the 25th, thirty-six hours later, it showed colonies of streptococci, although few in number. A consultation was now hurriedly called, at which were present Drs. Gruening, E. Libman, Chas. Schram and myself. In view of the positive blood culture and the deepening of the septic condition of the patient, in spite of the removal of the supposed infected fibroids, it was held, especially by Dr. Libman, that the infective process must be situated in the lateral sinus. It was therefore decided to make an exploration of the mastoid and of the lateral



sinus and to ligate the jugular vein. To determine the patient's chances of withstanding so severe a surgical intervention, a hemoglobin test was taken and it was found to be 60 per cent. On the same day at 3 P. M., Dr. Gruening, assisted by Dr. A. A. Berg, ligated the jugular vein and made an exploration of the mastoid and of the lateral sinus. Nothing abnormal was found beyond the chronic condition of the temporal bone giving rise to the formation of the cholesteatomatous masses. No evidences of suppuration of the mastoid nor of thrombosis in the sinus were found. The patient withstood the intervention very poorly and died two hours afterward. A full autopsy was not permitted, but Dr. Libman inspected the temporal bone and the lateral sinus and did not find anything abnormal.

As soon as the uterus was removed, Drs. Gruening and Schram, at my request laid it open and the several fibroid nodules. In the center of the nodule in the cervix there was a dark red streak occupying almost its entire length. Dr. F. S. Mandlebaum, Pathologist at Mt. Sinai Hospital, reported on this specimen as follows. Referring to this nodule, he states, "that the Gram-Weigert stain shows an enormous number of streptococci present throughout the section. These bacteria are not localized in any particular area, but are seen everywhere in the section. Sections made from the wall of the uterus at the site of the right uterine vessels, show a considerable degree of acute inflammation. The uterine artery seems to be free, but many of the veins in this area contain what appear to be purulent thrombi. The muscular tissue here is infiltrated with a large number of leucocytes. Streptococci are present throughout."

There can be no reasonable doubt that the severe general infection of the patient was caused by the streptococcic invasion of the submucous fibroid in the cervix and this in turn gave rise to the septic thrombosis of the uterine veins on the right side. The infection was evidently of the most virulent type, and while it is true the patient's end was hastened by the exploration of the lateral sinus, it was our opinion that the patient had little or no chance of recovery prior to this intervention. This, in spite of the fact that the evident source of the infection was removed thirty hours after the onset of the first symptom.

With the short time at my disposal, I have not been able to find much in the literature on the subject of bacterial infection of fibroids, independent of abortion and postpartum. In the *Archiv. f. Gyn.*, vol. xciv, there is an excellent article by Sitzenfrey of von Franque's Klinik, upon the bacteriology and histology of uterine fibroids attended with fever not due to extra-genital causes. Full reports are given of thirteen cases in six of which bacteria were found in the growth. In one of these cases

operated upon by von Franque, the tumor, which was quite large (16 cm. long diameter), showed on section small abscesses, varying in size from a pin point to a bean. The veins in the tumor were thrombosed and contained streptococci. Portions of the tumor, even in which the small abscesses were absent, showed the presence of streptococci, although in limited numbers. In a second case, staphylococci pyogenes albus and citreus were found in the interior of the tumor. In a third case, pseudodiphtheria bacilli in the interior of an interstitial fibroid were found. The patient presented no fever and made a good recovery. In a fourth case, with a temperature of 101 and a pulse of 150, streptococci and staphylococci pyogenes were found in the neighborhood of the abscess in the fibroid. The patient died suddenly on the third day after operation, presumably from an embolism. Von Franque on the basis of these observations asserts that myoma, of usual consistency and formation, exhibiting in nowise any disturbance in circulation, may reveal streptococci in their interior, in areas entirely free of abscess formation and without any plausible etiology. They may manifest no clinical phenomena, apart from some slight febrile disturbance. This description, however, would not cover one of the fatal cases in Sitzenfrey's series, in which, prior to operation the patient was very ill with a pulse of 150. After operation, the rapid pulse (140) persisted and the temperature rose to 104°. It would not fit our case either, in which the clinical phenomena were most alarming from the outset and, in which, the sepsis evidently was of the most malignant type.

Our case, perhaps, belongs to the type described by English and French authors as "red degeneration," in which, the central portion of the tumor undergoes necrobiosis, becomes soft and pulpy and presents a red coloration. It will be remembered that the infected nodule in our case exhibited a narrow streak of dark red color running through its center. In none of the cases, however, reported in the literature was the affected tumor as small as in our case and in none was there so severe a general infection.

In two cases reported by J. Lorrain Smith and Wm. Fletcher Shaw<sup>(1)</sup> in which toxemia was present, bacteria (staphylococci pyogenes and diplococci) were found in the thrombosed vessels of the tumor. J. Bland Sutton<sup>(2)</sup> published a case of large subserous fibroid attached to a uterus pregnant two months, with a temperature of 100 and a pulse of 120. The tumor on section

showed an area of red softening, 5 cm. in diameter and from this, pure cultures of staphylococci pyogenes aureus were obtained.

How do the bacteria reach these growths?

Von Franque holds that the infection occurs through accidental contamination of the blood current with bacteria and that the bacteria find a suitable medium for lodgment in areas, in which, the circulation and nutrition have become disturbed.

J. Lorrain Smith and Wm. Fletcher Shaw maintain that the bacterial infection is secondary to the thrombosis of the veins of the tumor. They make no mention of the source of the bacteria. Is it not more probable that the infection is a local one? We know that bacteria, especially streptococci, frequently inhabit the vaginal canal and may it not be that they are more often present in fibroid growths than we have any cognizance of. This would seem to be borne out by a case presented to this Society Jan. 14, 1908, by Dr. Geo. G. Ward(3). The operation consisted of a supravaginal amputation of a large uterine myoma in a patient apparently well. Virulent streptococcic infection followed with death in twenty-seven hours. Examination of the uterus afterward, showed the presence of numerous streptococci on the endometrium. All other probable sources of infection could be reasonably excluded. Von Franque has such a dread of occult bacterial infection of fibroid growths that, during operation, he takes precaution not to seize the growth with any sharp instrument. This seems to be carrying the fear to extreme.

The important lesson that the foregoing case and kindred cases in the literature, teach us, is that when obscure toxemia or general infection suddenly manifest themselves in a patient with uterine myomata, we must bear in mind the probability of a bacterial infection of the growth and act accordingly. These cases should also make us somewhat fearful of the general use of the x-ray in uterine myomata as seems to be the growing fashion abroad.

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751 MADISON AVENUE.

## STATISTICS IN RADICAL OPERATION FOR CANCER OF THE CERVIX UTERI.

BY

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ON March 31, 1898, I began the employment of radical surgical treatment of cancer of the uterus under the stimulation of Werder's paper that had appeared the month before in the *AMER. JOUR. OBST.* (xxxvii, 289-293).

The operation I then began using was a combination of Werder's and the one proposed by Ries (*Chicago Med. Rec.*, 1895, ix, 284-285) and was described with a report of my first fifteen cases in the *American Gynecological and Obstetrical Journal*, 1901, xvii, 312-322. This plan was modified February 22, 1902, by ligating the trunk or the anterior branch of the internal iliac arteries. Occasionally I have modified it by severing the vagina from above through a ribbon compressed and cooked by the Downes electrothermic angiotribe. My statistics of the employment of broad radical excision for cancer of the cervix down to three years ago are as follows:

Number of cases operated on.....	36
Mortality of operation was as follows:	
Shock.....	5
Peritonitis.....	2
Fecal fistula-asthenia (fourteenth day).....	1
Renal insufficiency.....	1
	9
Died from recurrence of cancer at	
End of one year.....	1
At end of eighteen months.....	1
At end of twenty-one months.....	1
At end of two years.....	2
At end of three years.....	1
	6
Died from other diseases:	
Of uremia after ureterocystostomy at time of operation (lived eleven years).....	1
Unknown intercurrent disease (lived two years)....	1
Of tuberculosis (lived six months).....	1
	3



Number living for more than three years without recurrence.....	8
Total after recovery from operation and not traceable	10

From this table it will appear that twenty-seven patients (75 per cent.) recovered from operation and that of these eight (practically 30 per cent.) have remained well for more than four years. In fact the precise amount of time they have survived the operation is for

One .....	14 years and 2 months.
“ .....	12 years and 3 months.
Two .....	12 years and 0 months.
One .....	9 years and 8 months.
“ .....	9 years and 1 month.
“ .....	7 years and 4 months.
“ .....	4 years and 9 months.

My second case, operated on April 4, 1898, was unique. A cancerous mass was found in the broad ligament surrounding and dilating the left ureter. The mass and its contained portion of the ureter were removed and the ureter implanted into the bladder.

The late Dr. James Carroll, U. S. A., examined the specimen microscopically and reported that while the duct was not involved in the malignant process, the surrounding mass was cancerous. This case was reported in my article of 1901. The patient was readmitted to the hospital in September, 1909. As I was absent from home, my associate, Dr. G. Brown Miller, treated her. She died a few hours after admission and no autopsy was done. Dr. Miller believed her fatal illness was uremia and I have wondered since if a defect in the unnatural ureterovesical junction had not been an etiological factor or if cancer had not recurred in the kidney or kidneys.

But assuming that the three patients dying from intercurrent disease and the ten that were not traceable, all died of recurrences, we have left eight patients that have lived a total of eighty-one years and three months, an average of ten years and two months since operation, without recurrence. The practical question we desire answered is whether such radical surgical procedures as we are now considering for the treatment of cancer of the cervix uteri are advisable.

While my experience is small, I am greatly influenced by it and believe the saving of 22 per cent. of cases for an average of

more than ten years is strong supportive argument. No doubt each of us has several cases of nonrecurrence for years following vaginal hysterectomy for cancer of the cervix. I frequently see two ladies that are in splendid health whose carcinomatous uteri I thus removed more than seven years ago. But I would reserve that operation for only those patients whose conditions prohibit the employment of the broad dissection by the abdominal route. I believe that an improvement in results may be secured not alone by an educational propaganda calculated to bring women suffering from this disease to operation early, but by changing the technic in two ways, to wit: to lessen the primary mortality and to lessen contamination during the operation. For the latter I would recommend the use of the cautery in some form. In my work I have since 1903 employed for this purpose Downes' electrothermic angiotribe which I have found to be a very serviceable instrument. Ligation of the trunks of both internal iliac arteries or of their anterior branches, if large, greatly assists in controlling hemorrhage, an important matter.

I am less an advocate of removing the pelvic lymphatic glands than formerly, as I think it markedly increases our primary mortality rate from shock. The time of the operation should come within the hour and will do so if not much time is used in dissecting out glands.

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## PERINEORRHAPHY IN PRINCIPLE AND IN PRACTICE\*

BY

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(With 12 Illustrations.)

THE practice of perineorrhaphy dates from the middle ages, tradition pointing to one Trotula, a woman attached to the school of Salerno in the eleventh century, as the first to suture a lacerated perineum: "*Post modum rupturam intra anum et vulvam tribus locis vel quatuor suimus cum filo de serico.*"

From this remote record to the present time, a span of nearly one thousand years encompasses the evolution of perineorrhaphy, every phase of which is linked with names of the most illustrious surgical exponents, and with a literature which offers the most

\*Read before the New York County Medical Society, Feb. 26, 1912.

ancient, the most voluminous, and yet the most incomplete chapter in modern gynecology.

The history of perineorrhaphy exemplifies the clinical axiom, that "multiplicity in methods implies diversity in fundamental conceptions."

"To no department of gynecology," wrote Thomas thirty years ago, "does there attach more surgical rubbish which needs a thorough clearing away, than to perineorrhaphy.

"It has afforded a fruitful field for attempts at originality and innovation; successive investigators too often seeming to strive not so much for simplicity as for some peculiarity of procedure which they could call their own."

Three years later Emmet inaugurated what may be termed a renaissance in perineorrhaphy by demonstrating the significance of the musculofascial elements in the nature and repair of perineal injuries. Nevertheless, while thus among the first to recognize correct anatomic essentials for a reparative method, he devised an operation, the ultimate results of which have not tended to sustain that prestige among contemporaneous procedures, bestowed upon it by the authoritative name of its advocate, for after a vogue of nearly three decades, Jewett in 1905 characterizes "The female perineum with its surgical problems" as the "pons asinorum of the gynecologist"; adding that "the surgical anatomy, the nature of obstetric injuries and the rationale of their repair, are questions long in dispute and their solution still remote."

Irving S. Haynes, in an article on "The anatomic basis for successful repair of the female pelvic outlet," asserts that "the treatment of pelvic lacerations is in sufficient chaos to justify a reasonably careful review of the salient features of the subject."

In the same vein W. W. Babcock pointedly depicts the practice of perineorrhaphy in 1909 as follows: "The methods of perineorrhaphy that have been chiefly employed for the last twenty-five years, suggest more of a mathematical than an anatomic basis for their existence. For the most part, they have consisted of excisions of mucous membrane from the posterior vaginal wall, having geometrical patterns that vary as do the fancies of the different surgeons."

"In support of the various operations, much has been written about the laceration in the muscular and fascial planes and of the effectiveness of particular operations, yet one who studies the work of various gynecologists will be impressed by the thought

that usually the precise anatomic restoration of the perineum occurs only in the theory of the operator, for the operation as a rule, consists of little more, than the removal of an area of mucous membrane and the union of the wound edges. . . . If at times, the operator's needle is made to sweep in various direc-

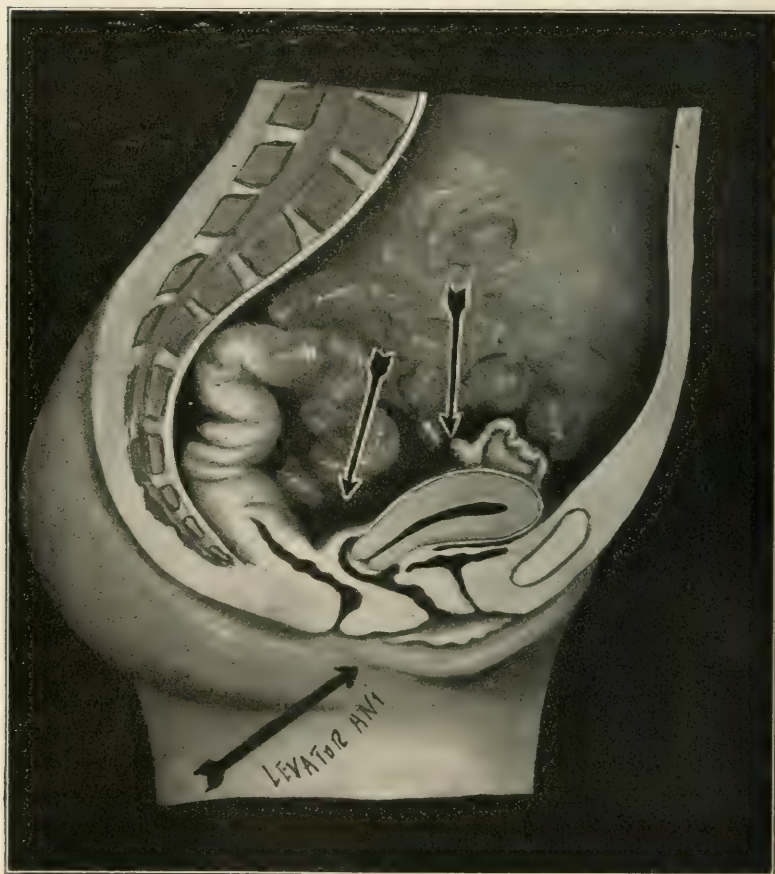


FIG. 1.—Normal deflection of intra-abdominal pressure and dissection of levator action.

tions, with the specification that certain muscles are caught in its grasp, the precise evidence that such muscles are included and especially any evidence that the important fascial planes of the perineum are restored is rarely observed."

The veteran Henry O. Marcy concludes one year later that



"The basic principles of the operation are still in a measure misunderstood."

C. M. Watson tersely epitomizes the sum and substance of the whole problem by stating that "The classic operations for the secondary repair of the torn or relaxed perineum, have been



FIG. 2.—Direction of intra-abdominal pressure, "undeflected" as a result of incompetence. Development of cystocele.

successful only to a degree; the more extensive the injury to the levator ani muscle, the less effective these operations."

The last clause in this quotation embodies the crux of our theme—namely, *the significance of the levator ani in perineal support and the essentials of its repair in perineal injury.*

This statement, like all that precedes and follows, found previous utterance in my paper on this subject published nearly

eight years ago, the present communication only elaborating and elucidating my former contentions.

Any unbiased criticism of the results following the classic methods of perineorrhaphy in vogue will concede a more or less perfect cosmetic restoration of perineal contours and bulk, in which, however, the all essential physiologic muscular element in pelvic support is supplanted and immobilized by a vicarious cicatricial plug at the vaginal outlet.

Such result fulfills all the indications for those who continue to see a "perineal body forming a triangular wedge, composed of



FIG. 3.—Appearance of levator ani with body in horizontal position.

fascia and areolar tissue," instead of a muscular pelvic floor—and who still adhere to the theory that ascribes the rôle of the perineum in the coördination of gynecic support to *form* rather than *function*.

Obstructive retention at the vaginal outlet cannot permanently replace normal physiologic support, and the aim in perineorrhaphy must be the restitution of such anatomic relations, as to restore, as far as possible, physiological as well as mechanical support to the pelvic contents.

The keynote in the clinical significance and therapeutic indica-

tions of perineal lacerations is the existence of prolapse; which presents itself in two forms.

First as a simple ectopia of the relaxed and redundant vaginal mucosa. This form of prolapse need not occupy us here beyond stating that it is curable by any of the stereotyped operations, which remove various patterns of the protruding vaginal tissues.

The second form, which presents the true hernial descent of bladder, rectum and uterus, cannot be permanently cured by any procedure that substitutes mechanical occlusion in the form of a

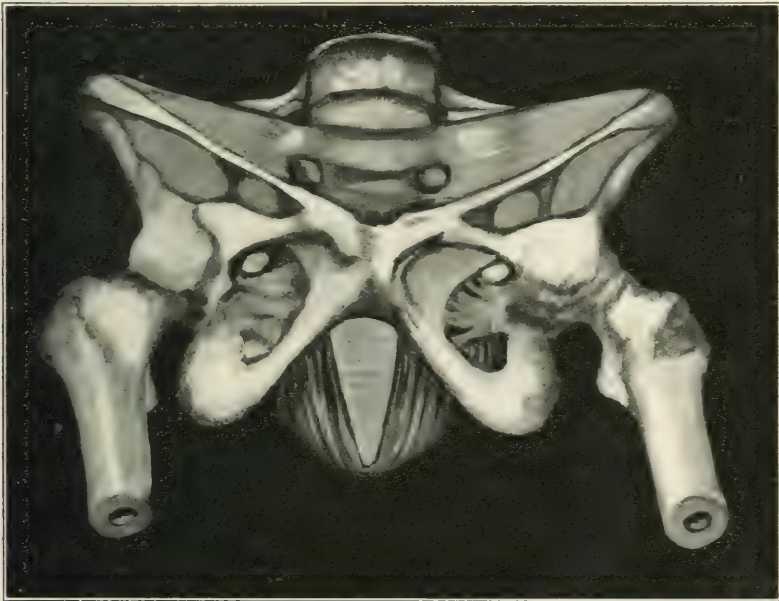


FIG. 4.—Appearance of levator ani with body in semi-prone position.

cicatricial wedge at the vaginal outlet for the physiologic retention exercised by the muscular contractility in the pelvic floor.

It is a gross misconception of function that attributes visceral support to the mere textural resistance of supporting structures.

Muscular contraction as the essential factor in perineal support is still disputed; nevertheless, the ocular and palpatory evidence of this function can be convincingly demonstrated in every normal perineum by the simultaneous contraction and elevation of the vagina that responds to every augmentation of intraabdominal pressure, such for example as that induced by coughing: in other words, it will be found that the same impulse induces

synchronous but opposite contractions in the perineal and abdominal musculature; furthermore, the muscular character of pelvic support accords entirely with a recognized morphological law which holds throughout the mammalian order, recognizing all weight-bearing functions as essentially muscular in nature, clonic in rhythm and continuous in effect.

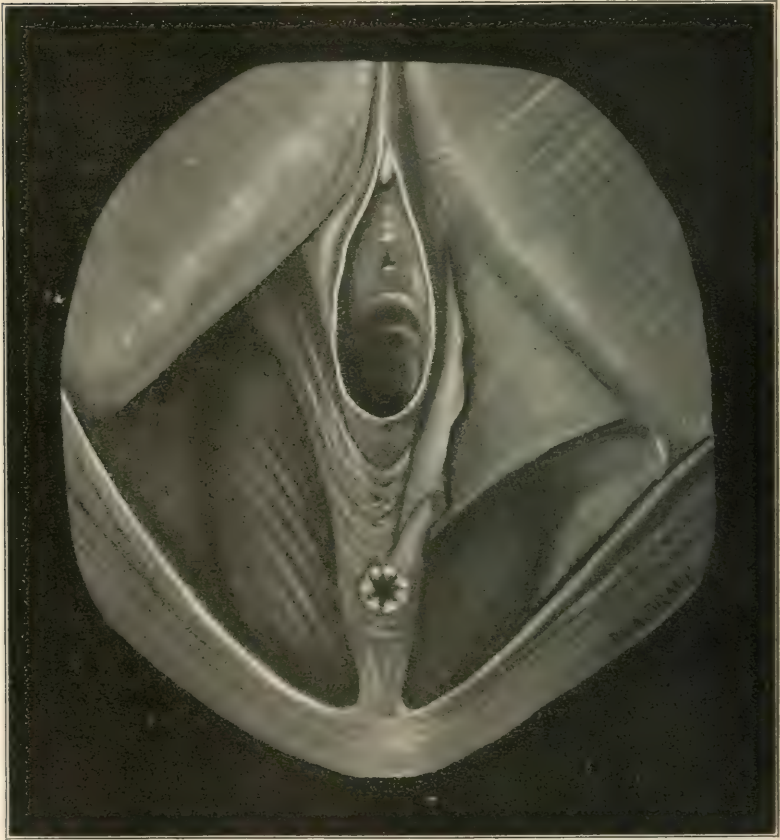


FIG. 5.—Showing normal levator fibres in recto-vaginal septum.

On the other hand, the perineal musculature should not be conceived as presenting simply a sphincter at the pelvic outlet, nor a mere muscular bottom passively bearing the weight of its superimposed organs. It is an active integral part in a complicated mechanism, that counteracts the expulsive force of intra-abdominal pressure, *not by the strength of its textural resistance as*



*such, but by mechanically deflecting the direction of that force toward the normal outlets.*

To elucidate the nature of this mechanism, we must recall certain physical principles that dominate its function as a supporting apparatus.



FIG. 6.—Locating levator bands prior to denudation.

According to a fundamental law in dynamics, the direction of a given force, or body impelled by such force, impinging against a resistant plane, becomes deflected in a definite manner; the degree of deflection being governed by the axis of the plane's surface.

This finds familiar exemplification in the mechanism of labor,

when the initial direction of the expulsive force becomes deflected by the pelvic planes and thus impels the fetal ovoid through the different axes of the parturient channel.

In applying this law to the problem of perineal support we define intraabdominal pressure as the initial force to be deflected; the mobile intestinal coils as the medium through which this force manifests itself and the pelvic floor as the deflecting plane.

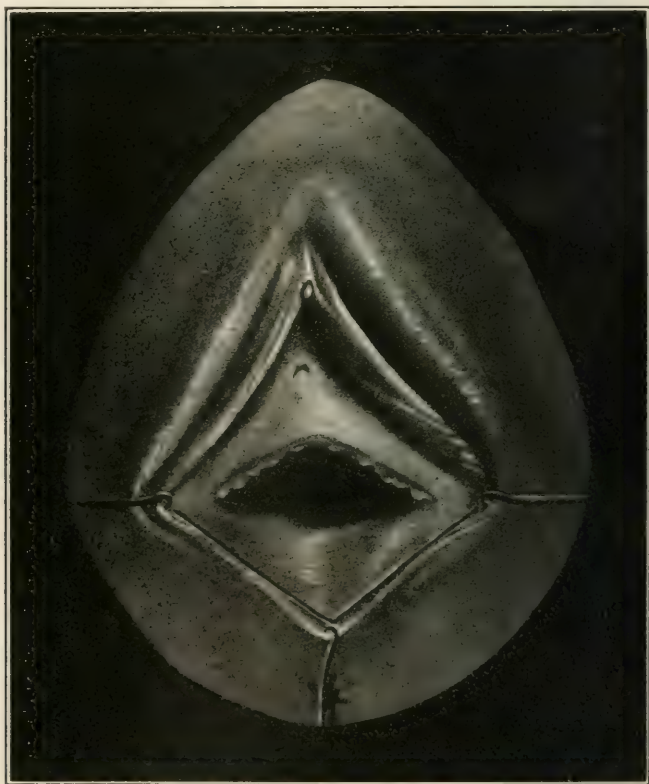


FIG. 7.—Outlining flap.

Owing to the normal backward tilt of the pelvis the abdominal and pelvic cavities do not communicate in a straight line but at an obtuse angle. The equalization of tension essential to visceral equilibrium between the two cavities necessitates a uniform deflection of intraabdominal pressure from its initial vertical direction in the abdomen to the oblique axis of the pelvic inlet; this deflection, as already indicated, is exercised by the inclined

upper surface of the plane which serves as a common floor to both the abdominal and pelvic cavities.

While abdominal pressure is constant and continuous it varies in intensity, being augmented by every effort that calls the abdominal muscles into action. Each augmentation of pressure demands a proportionate increase in resistance, which demand is met by a synchronous counter-contraction in the perineal musculature.

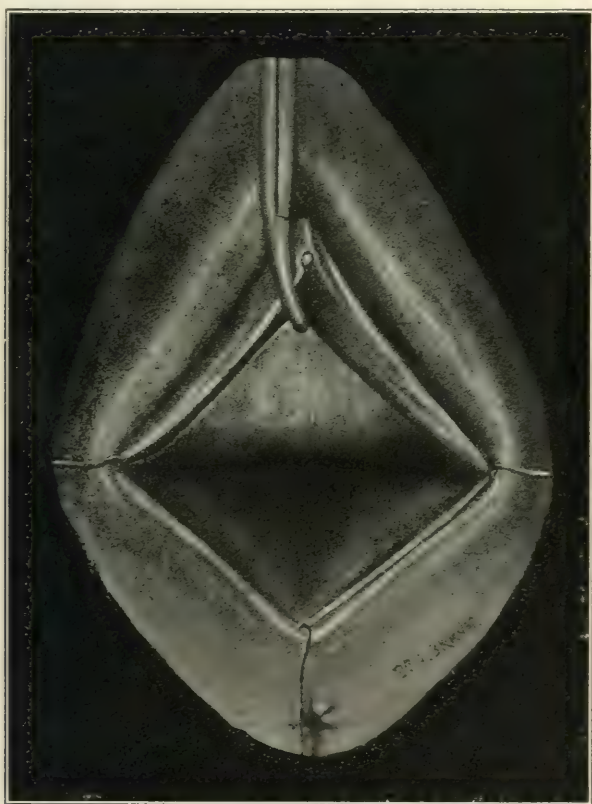


FIG. 8.—Elevation of flap.

Accepting the principle of deflection as applicable to our problem, it follows that every deviation from the normal, in the angle and resistance of this deflecting plane, must necessarily induce a corresponding deviation in the direction of intraabdominal pressure, with resulting topographic disturbance.

The normal contours and topographic arrangement of the pelvic floor and its superimposed organs all conform to subserve this deflecting function.

If we study the pelvic floor with the body in the erect posture, we will find that the cutaneous perineum extends horizontally from the posterior vulvar commissure to the coccyx, while the upper or intraabdominal surface of the pelvic floor, conformable



FIG. 9.—Sutures passed around muscles.

with its function as a deflecting plane, slopes obliquely from the pubes, downward and backward, in a line parallel to the axis of the pelvic inlet.

This divergence of the upper from the under surface outlines the triangular configuration of the pelvic floor. Its apex at the coccyx is less than half an inch in thickness; its base at the pubic arch occupies a space of over 3 inches.

The vagina, bladder, uterus and rectum rest upon and constitute part of this inclined plane, the whole structure being swung



in the muscular hammock formed by the levator ani loops, which, by their contractile response to pressure, maintain its form, level, incline, and topographic relations.

Contrary to general impression, the direction of the vaginal canal is practically horizontal, it is interposed between the muscular layer in the pelvic floor and the superimposed pelvic viscera, the disposition of its walls being superior and inferior, not anterior and posterior.

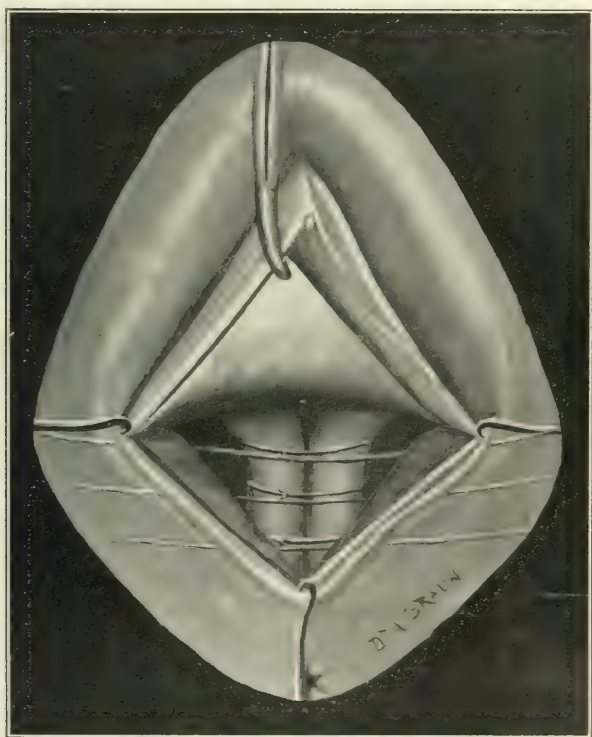


FIG. 10.—Muscle suture tied. Suture of deep and superficial layers not tied.

Its orifice is held in the most anterior of the levator loops, in a plane just posterior to that of the pubic arch.

Every augmentation of pressure that forces the uterus downward stimulates the levator to lift the vagina upward, constricting its orifice against the pubic arch and closing the uterovaginal angle; the greater the pressure, the narrower the angle and the firmer the resulting vaginal closure.

Concisely stated, the levator ani muscle prevents prolapse of the pelvic contents by counteracting the influence of intraabdominal pressure. It is the antagonist of the diaphragm and abdominal muscles, contracting when these opposing muscles contract and relaxing when they relax. When intact it maintains the equi-

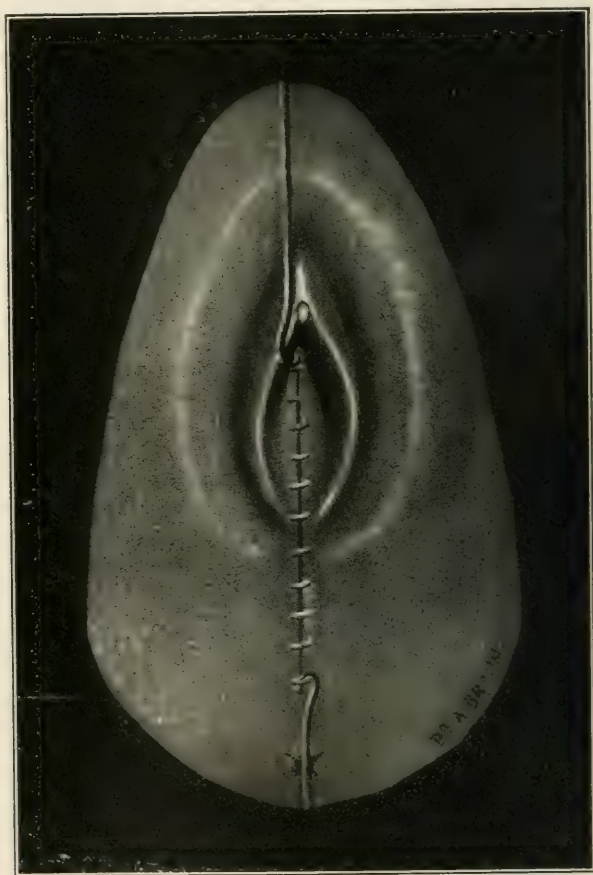


FIG. 11.—Suture complete.

librium of the pelvic viscera; when its integrity is impaired, equilibrium is disturbed and displacement ensues.

The levator ani is not a single muscle but a radially disposed plexus of flat muscle segments enclosed and separated by fascial investments and composed of striped and unstriped muscle fibers. While its individual segments may be separately demon-

strated at their origin, they become intimately and inseparably blended with each other and with the aponeurotic tissues in the perineal center and anococcygeal raphé.

Functionally, a sharp demarcation characterizes the coccygeal and pubic divisions of the levator muscle.

The coccygeal division comprises the thin posterior semimembranous segments that are inserted into the sides and tip of the

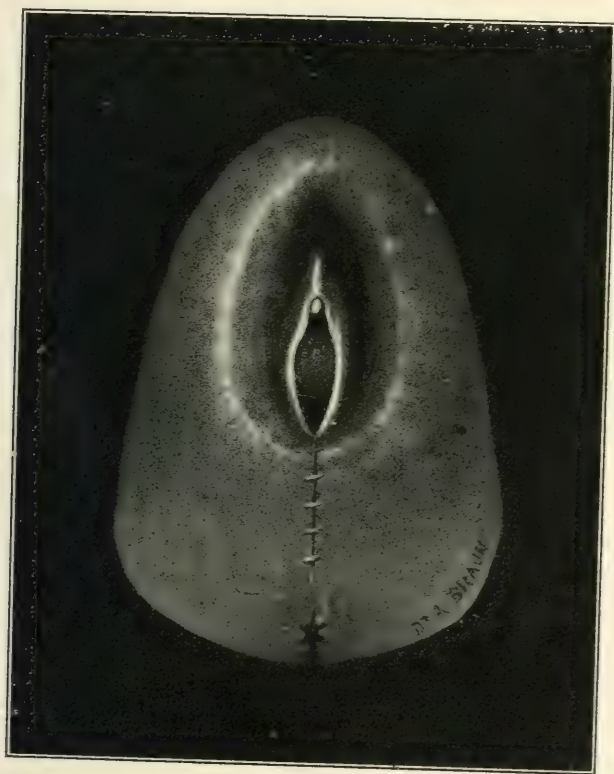


FIG. 12.—Appearance at end of operation.

coccyx. These are devoid of special function, representing vestigial structures homologous with the caudal flexors in the lower animals, and are of anthropologic interest only.

The functionally essential elements of the levator ani are the pubic bands commonly designated pubovaginalis, puborectalis, and pubococcygeus, respectively.

The bulk and strength of these muscles are much greater than

current anatomic descriptions and postmortem appearances would indicate.

Their lines of origin extend for 1 1/2 inches on either side of the posterior surface of pubic symphysis, thus equalling in width the average sterno mastoid; they are twice as thick as the diaphragm, weigh one-fourth as much as this muscle and half as much as the external oblique, altogether presenting a muscular support exceeding that guarding the inguinal ring.

Their dynamic energy as developed by Dickinson's experiments, ranges from 10 to 27 traction pounds.

These pubic segments course almost horizontally backward and inward along the lateral vaginal walls. They converge rapidly toward each other to become inserted into the rectovaginal septum, the perineal center, the rectal walls and the anococcygeal tendon, encircling the vagina and rectum in distinct loops.

Their median borders, which are plainly palpable through the lateral vaginal walls, half inch or less behind the plane of the hymen, form a V-shaped interspace which embraces the introitus under the pubic arch.

Every perineal laceration that impairs or destroys a previously normal intrapelvic support, has injured or severed the junction of the pubic levator segments along their line of insertion, which usually corresponds to the posterolateral vaginal sulcus.

The severed muscles retract behind the ischial rami, widening the introitus, with resulting eversion and ultimate protrusion of the vaginal folds through the gaping orifice.

The cleft created by the divergence of their median borders gives vent to the anterior rectal wall in the formation of rectocele.

The vaginal floor, thus deprived of its muscular crotch and shortened to the extent of its laceration exposes the upper vaginal wall and leaves the bladder base unsupported.

The entire vaginal canal with its superimposed viscera descends to a lower level. The prolapsed vaginal pouches with their hernial contents gradually drag the anteverted cervix toward the yielding outlet. The uterovaginal angle becomes widened, the uterus telescopes the vagina and the prolapse is complete.

The prevailing practice of combining perineorrhaphy and laparotomy in one sitting affords opportunity to note the effects of levator rupture upon the pelvic contents as seen from above.

The first abnormality to obtrude itself after opening the abdomen is the absence of the uterine fundus from its normal situation and the presence in its place of intestinal coils.



On clearing the pelvis of these coils, the normal incline of the upper pelvic floor is found converted into a hollow formed by the distorted uterovesical space with the retroverted uterus posteriorly and the bladder at the bottom; in other words, the crippled levator permits the anterior part of the pelvic floor to sag, levelling its essential incline. The direction of intraabdominal pressure, no longer deflected, falls full upon the vesicouterine space which deprived of its muscular buttress, becomes pouched and distended with intestinal coils.

From all the foregoing the function of the levator ani muscle in perineal support may be tersely summarized as follows:

Its contraction diminishes the force of intraabdominal pressure upon the pelvic contents by deflecting its course; increases the resistance to that pressure by closing the uterovaginal angle; closes the pelvic outlet against that pressure by compressing the vaginal canal.

A study of the vaginal extrusions resulting from perineal lacerations reveals elements closely analogous to those of inguinal hernia.

Both conditions result from muscular insufficiency over a vulnerable intraabdominal site, tunnelling their outward course along potential channels between the muscular and fascial layers of the abdominal walls.

The levator ani embracing the abdominal floor is as much an abdominal muscle as the obliquus, transversalis or rectus. Furthermore, the form and nature of the muscular arrangement guarding the inguinal openings above the pubes is the exact counterpart of the levator arrangement beneath the pubes.

The fully developed cystocele is a complete hernia, equipped with its peritoneal sac containing intestine and frequently omentum, differing from inguinal hernia only in that the bladder and vaginal wall enter into the formation of its coverings.

In the same manner the rectocele will be found to present a hernia of Douglas's pouch.

The radical cure of inguinal hernia became possible only with the recognition of its two essentials—namely, the restoration of contractile muscular resistance to the hernial area and the obliteration of its peritoneal funnel. In other words, the muscular and serous planes are so reconstructed as to reestablish the normal deflection of intraabdominal pressure, causing the intestines to glide *over* instead of *into* the hernial gap.

The application of this principle to perineorrhaphy, by the

method of levator interposition and suture, was first submitted by me before the Medical Society of Greater New York, Feb., 1905, and published in the *Medical Record*, April 1, of the same year. Notwithstanding that this paper failed to attract authoritative notice at the time, I had the subsequent gratification to find its fundamentals advocated in methods practised by widely separated surgeons, notably Holden, Kelly and Noble, Haynes, Babcock and Watson in this country, Piquand and Renaud in France.

All of these latter procedures, however, present only technical variants of one and the same principle—namely, restoration of levator function.

The operation may be described as comprising four essential steps.

1. Exposure of the seat of lesion.
2. Mobilization of the muscles.
3. Sutural interposition of the muscles.
4. Readjustment of the superficial coverings.

Preliminary to the first step, the uterus should be replaced in its normal position and the retracted levator bands located on each side by palpating their inner borders where they jut from behind the pubic rami toward the median line under the vaginal mucosa.

The separation of the mucosa is facilitated by hooking a tenaculum on each side of the vaginal orifice into the tissues just external to the lowermost caruncle and another into the center of the posterior mucocutaneous margin; by traction upon these three points a triangular flap is outlined which is separated from the underlying tissues up to the crest of the rectocele but *not* excised.

The confusing multiplicity of terms applied to the anterior levator segments make it necessary to recall here that, surgically, this whole group constitutes one muscle bundle about 1 inch in width and  $3/8$  inch thick behind either pubic ramus.

The flap of vaginal mucosa being reflected upward, a finger or closed scissors is thrust into the narrow lateral sulcus, which is distinctly palpable on either side between the inner edges of the ramus and muscle and the latter bluntly liberated from its fascial and cicatricial surroundings along the *whole* extent of its outer circumference, preserving its median coverings as far as possible.

The mobilization should be of sufficient extent to permit a

broad approximation of the corresponding levator bands without tension.

Occasionally a spurting branch of the internal pudic artery demands ligation, otherwise the bleeding though free is largely venous and promptly controlled by pressure.

The method practised by a number of surgeons, in which a thin edge of muscle is drawn through a slit in the lateral fascia on each side and sutured without previous mobilization, is not to be commended as it results in the formation of a thin crescentic diaphragm behind the introitus, productive of disagreeable sequellæ.

From three to four interrupted, twenty-day chromic gut sutures coapt the muscles and close the intermuscular gap in front of the rectocele; each suture is passed from side to side *not through* but entirely around both muscles, encircling them so as to secure their broadest possible surface contact under the vaginal floor.

The rectocele should not be caught in the suture nor pinched between the muscles, the uppermost suture being inserted just high enough to normally appose the lower to the upper vaginal wall.

In adjusting the superficial coverings no vaginal mucosa is removed; the transverse wound is converted into a perpendicular slit by properly applied traction, and the edges united side to side by continuous or interrupted plain gut suture.

From the tip of the vaginal flap to the caruncles the suture includes vaginal mucosa only, while from the caruncles downward, each stitch is made to gather the skin and all of the fascial layers which are drawn from under the lateral edges of the wound toward the median line.

The resultant comb of vaginal flap is tucked into the vagina and the operation completed by the introduction of a gauze strip to absorb the first oozings.

The interposed muscle in the rectovaginal septum thus provides contractile resistance over the two hernial areas in the vaginal canal—namely, the uterovesical above and the uterorectal below.

Sanctioned by an active experience with this operation, now covering a period of nearly ten years, I can conscientiously assert that a strict adherence to the details of the foregoing technic will yield results which, three months after operation, make it impossible to distinguish the previously lacerated perineum from the normal, both in form and in function.

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## HODGKIN'S DISEASE INVOLVING THE UTERUS.\*

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New York City.

(With Six Illustrations.)

CASES of Hodgkin's disease in which ovaries or testicles have been involved are on record, but examination of the literature does not show any description of changes in the uterus. A feature of interest in this case is the fact that pregnancy took place, and birth was given to a healthy child four months after the neck enlargement occurred, and one month before admission to the hospital. The size of the uterus on admission, and the marked sclerotic changes shown at autopsy three months later would indicate that this organ had been affected early in the disease. From the standpoint of clinical diagnosis the case is of interest, the enlargement of the uterus suggesting a new growth of an advanced inoperable character with metastases in most of the superficial lymph nodes.

*Clinical History.*—Mrs. H., admitted to the New York Skin and Cancer Hospital, March 17, 1911. Age forty-three years. Birthplace, Russia. Service of Dr. Bainbridge, by whose courtesy the case is reported.† Family history negative. Does not use alcohol. Has had ten children, last four weeks old. One miscarriage.

*Previous Diseases.*—Chronic rheumatic manifestation during the past year.

*Present illness* began November, 1910, with enlargement of glands of both axillæ. Two weeks later glands of right groin enlarged, then glands of neck, and finally there was general enlargement of the external glands to the size of a pea or greater.

*Physical Examination.*—Poorly nourished. Heart and lungs negative. Glands of neck, axillæ, and groins enlarged. Neck and breasts greatly swollen, and skin tense over this area. Vaginal examination showed an enlarged uterus. The clinical diagnosis of sarcoma of the uterus with metastases in the lymph nodes was made. The patient was under observation for three months. Axillary and inguinal nodes were excised for examina-

\* From the Research Laboratory of the New York Skin and Cancer Hospital.

† Presented at a meeting of the New York Pathological Society, January 10, 1912.



FIG. 1.—Photograph after admission to hospital, showing swelling of the neck and skin lesions.

tion. The inguinal nodes, excised in March, showed necrosis. A month later axillary nodes showed typical tubercle tissue with giant cells. (Some of these nodes later showed tubercle bacilli.\*) The great superficial swelling of the upper part of the body was accompanied by itching. Thickening and infection of the skin resulted from the patient's scratching. Sections of this thickened skin showed inflammatory changes, but nothing on which to base a diagnosis of new growth or of Hodgkin's disease.



FIG. 2.—Uterus invaded throughout by Hodgkin's disease. Tubes and one ovary also invaded. Photos by K. Bosse.

During her stay in the hospital the patient suffered from pain in the neck and arms, which remained swollen. There was rapid pulse, dyspnea, and periods of marked restlessness, especially at night. The temperature remained normal except for an occasional short rise. Repeated blood examinations showed an increase of polynuclears, the range being 85 to 93

\* Reexamination of some of these nodes in the light of subsequent diagnosis shows areas suggesting Hodgkin's disease.

per cent. There was no increase of eosinophiles. Death appeared to be the result of exhaustion.

Autopsy, by Dr. R. F. Barber, June 25, 1911. Female of about forty; emaciated. Extensive swelling of neck, more so on right side. Rigor mortis not developed. Both axillæ and

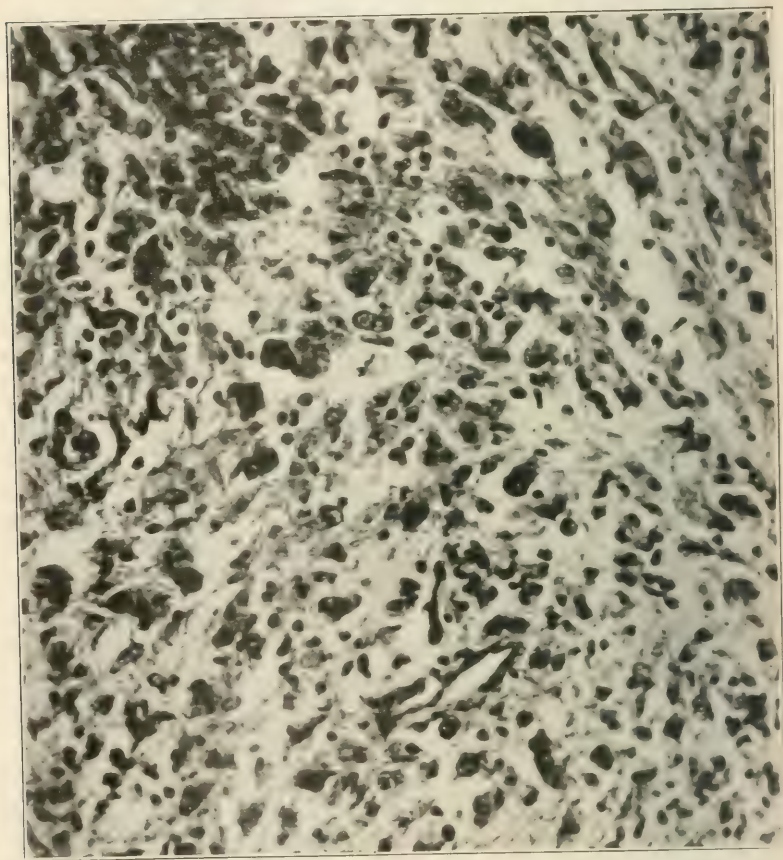


FIG. 3.—Uterine wall near mucosa showing giant cells and endothelial cells.  
( $\times 400$ .)

breasts infiltrated with hard nodules; nodules also in groins. Entire body covered with an eruption of spots the size of millet seeds, some crusted, some showing complete healing. *Thorax:* Mediastinal glands enlarged. *Left lung* collapsed; left pleural cavity filled with bloody fluid. *Right lung* adherent. *Heart* normal. *Spleen* normal size; shows small white nodules. *Kid-*



*neys and pancreas normal. Liver congested. Gall-bladder normal. Iliac lymph nodes enlarged, ranging in size from 1 to 3 cm. Mesenteric nodes uniformly enlarged. Stomach normal. Uterus measures 12 cm. in length and 9×6 cm. at fundus. Surface nodular. Entire wall infiltrated with growth of dense fibrous tissue, which has caused apparent destruction of all the*



FIG. 4.—Section of cervix showing almost entire loss of glands. (×42.)

*muscularis. Tubes show similar nodular thickening at uterine end. Ovaries normal size; fibrous. One of them shows an area of pale fibrous tissue similar to the area in the tubes.*

*Microscopical Examination.*—Sections of different parts of the uterus show growth of endothelial cells, small round cells, with scattered giant cells. Portions are densely fibrous

in character. The mucosa is almost entirely replaced by the growth, only a few scattered glands appearing in sections from the body and the cervix. The nodules in the tubes and in

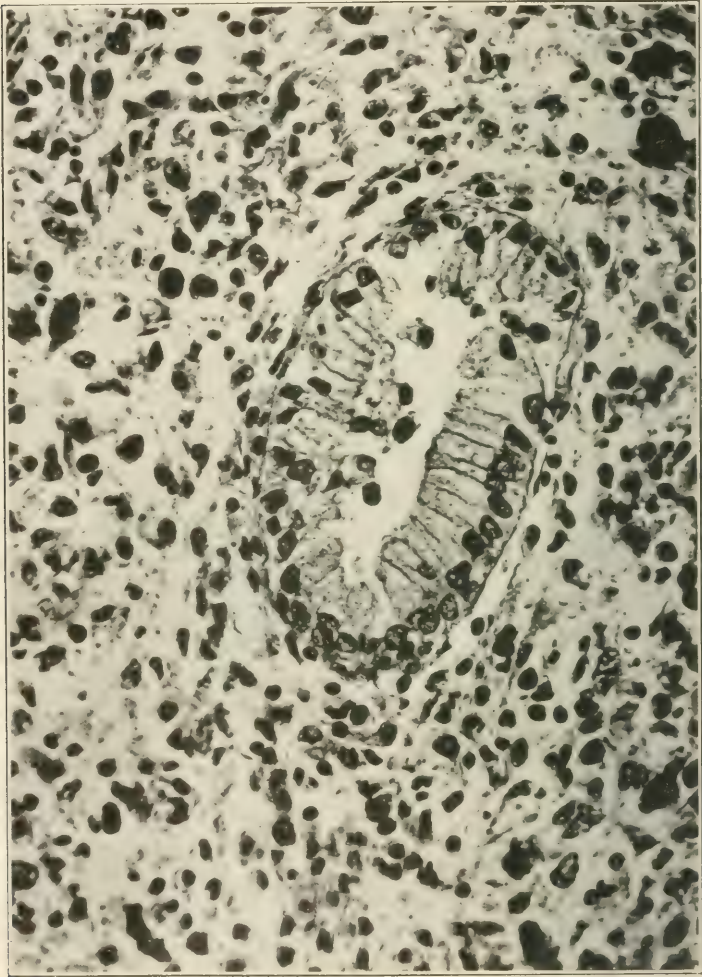


FIG. 5.—Cervix gland surrounded by the Hodgkin's disease changes in the stroma. ( $\times 400$ .)

one ovary show similar changes. The appearance characteristic of Hodgkin's disease was found in the mesenteric, iliac, and bronchial lymph nodes, in the breast, and beneath the skin of the neck. In the spleen the growth was very cellular with

mitoses in many cells and but little fibrous tissue, indicating recent involvement.

*Diagnosis.*—Hodgkin's disease involving the uterus, tubes and ovary. It seems proper to consider the tuberculosis of the axillary nodes as accompanying and not as causing the

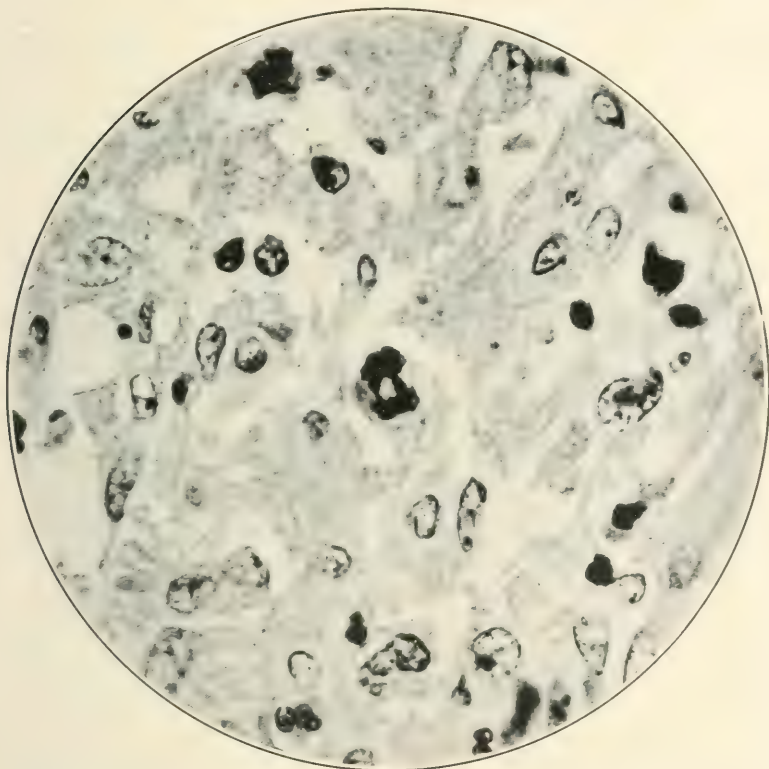


FIG. 6.—Hodgkin's nodule in spleen showing mitoses in some cells. ( $\times 900$ .)

changes found elsewhere, the appearance of the tuberculous nodes being entirely different from those showing Hodgkin's disease. This would agree with the conclusions of Dorothy Reed in her study of the relationships of tuberculosis to Hodgkin's disease.\*

601 WEST 113TH STREET.

\* Johns Hopkins Hosp. Rep., 1902.



A CONSIDERATION OF PARAGRAPH 79 OF THE "PAGE  
LAW" AND THE METHOD OF ITS ADMIN-  
ISTRATION IN THIS CITY.

BY  
FREDERIC BIERHOFF, M. D.,  
New York.

IN 1908 a Commission was appointed by the Legislature of this State, pursuant to Chap. 211, of the laws of 1908, whose duty it should be "To inquire into the manner in which justice is administered in the courts of inferior criminal jurisdiction in cities of the first class." This Commission was popularly known as "The Page Commission," after its chairman, State Senator Alfred R. Page. It began its inquiry on November 24, 1908, in the City of New York, and after seventeen months of work, including many sessions in the larger cities of this State, to which were invited many persons having a knowledge of matters dealing with correctional and penal institutions, the Commission presented its report to Governor Hughes, on April 4, 1910.

The recommendations of the Commission were embodied in a measure entitled, "Assembly Bill No. 2240" and after various hearings this was passed by both houses of the Legislature and signed by Governor Hughes on June 25, 1910, becoming a law on that date.

Among the provisions of this law there was one for the establishment of a separate night court for women, which provided also for the separation of the younger and less hardened from the older and more hardened offenders, as well as further provisions for the identification of the prostitutes, by means of the finger-print system, and also for the medical examination of convicted prostitutes. The paragraphs in question read as follows:

"Par. 77. Night courts; separate court for women. On and after the first day of September, nineteen hundred and ten, the board of city magistrates of the first division shall provide for the holding of two night sessions of the court, one of which shall be exclusively for the hearing of cases and proceedings against men, and against men and women charged with offenses arising out of the same transaction, and one exclusively for the hearing of cases and proceedings against women. The said night sessions of courts shall be held in different buildings, and each



night court shall open at eight o'clock in the evening and remain open until three o'clock in the morning. All persons who are arrested, except upon a charge of felony, after the day courts are closed, or at any hour too late to be brought to a day court, must be brought to the night courts. There shall be established on or before October first, nineteen hundred and ten, a place of detention, under the jurisdiction of the commissioner of correction, convenient to the night court for women, where women may be detained both before and after being heard, and in such detention place the young and less hardened shall be segregated, so far as practicable, from the older and more hardened offenders."

"Par. 78. Identification of prostitutes; finger-print system. In the night court for women, and such other courts as the board of magistrates may designate, there shall be established and maintained the method of identification of prisoners known as the finger-print system. The finger-prints of all females convicted under subdivision four of section eight hundred and eighty-seven of the code of criminal procedure, subdivision two of section fourteen hundred and fifty-eight of the consolidation act or section one hundred and fifty of the tenement house law, shall be taken by officers or employes of the police department detailed for that purpose. Three impressions shall be made of all such finger-prints. One impression shall be classified and preserved in the court where the same was made; a second impression shall be promptly delivered to and classified and preserved in the office of the chief clerk of the division, and the third shall be forthwith delivered to the police commissioner. The board of city magistrates of each division shall designate a day court at which shall be arraigned women charged with the violation of the provisions of law in this section referred to, at which said court said finger-print system shall be established and maintained, in order that all persons convicted of the offenses in this section mentioned, whether arraigned in the day time or at night, shall be identified in the manner herein described."

"Par. 79. Medical examination of prostitutes. On and after the first day of September, nineteen hundred and ten, any person who is a vagrant, as defined in subdivision four of section eight hundred and eighty-seven of the code of criminal procedure, or who is convicted of a violation of subdivision two of section fourteen hundred and fifty-eight of the consolidation act, or of

section one hundred and fifty of the tenement house law, shall after conviction be taken to a room adjacent to the court room, and there be physically examined by a woman physician of the department of health detailed for such purpose. After such examination the physician making the same shall promptly prepare and sign a written report of the prisoner's physical condition, and if it thereby appears that the prisoner is afflicted with any venereal disease, which is contagious, infectious or communicable, the magistrate shall commit her to a public hospital ward or wards for the treatment of the disease with which she is afflicted for detention and treatment for a minimum period fixed by him in the commitment and for a maximum period of not more than one year; provided, that in case a prisoner so committed to any institution shall be cured of her venereal disease, which is contagious, infectious or communicable, after the expiration of the minimum period and before the expiration of the maximum period for which she was committed to such institution, she shall be discharged and released from custody upon the written order of the officer in charge of the institution to which she was committed, upon the certificate of a physician of such institution or of the department of health, that the prisoner is free of any venereal disease which is contagious, infectious or communicable. If, however, such prisoner shall be cured prior to the expiration of the minimum period for which she was committed she shall be forthwith transferred to the workhouse and discharged at the expiration of said minimum period. Nothing herein contained shall be construed to limit the authority of a city magistrate to commit any prisoner for an indefinite period to any institution now having authority by law to receive inmates for detention for more than one year."

Paragraph 78 dealing with the finger-print system existed prior to the date of the passage of the Page Bill. Paragraph 77 provided for the separation of female prisoners from the males, and for the separation of the younger offenders from the older and more hardened. Paragraph 79 provided for the medical examination of convicted prostitutes and for the care in a city hospital of those found to be afflicted with a venereal disease, but as may be seen from a careful perusal of the paragraph in question, *a conviction upon the misdemeanor charge was necessary before such a medical examination might be made*—in other words, the procedure was as follows:

The woman arrested for prostitution or for soliciting was taken

to the women's court, and brought before the judge on duty. The case was tried in the usual manner, and if the woman was convicted, the provisions of the law required that sentence be delayed until after the completion of the medical examination by the examining physician. Women found upon examination to be afflicted with venereal diseases were then held in the court prison until such time as they might be transferred to the hospital. These found to be free of venereal disease were again brought before the court for disposition of their cases, in the usual manner—workhouse sentences, fines, placing under parole, or discharge. All examinations of convicted women were made by female physicians, appointees of the Board of Health, and were made only in the presence of the physician in question and a nurse of the department, and occurred in a room in the court building, specially set aside for that purpose.

It was the aim of those responsible for the provisions of Paragraph 79 to make it impossible for the judges sitting upon the cases to discharge diseased prostitutes after conviction or merely to fine them and turn them loose again to spread disease (for, prior to the passage of the law in question, there had been judges who made it a practice to fine even hardened offenders, or regularly to dismiss them under the plea that it was a hardship to arrest these women, and who maintained that they should be left alone) and it was also designed to make it possible to treat the infected prostitutes in a hospital and to keep them in the institution until well, and with this end in view the sentences had provided for a minimum term and a maximum of one year. Thus, if a woman sentenced for thirty days was found to be cured of her disease within three weeks, she was, after discharge from the hospital, at once transferred to the workhouse where she served the balance of her term. Should, however, the disease in this same woman not be cured within six weeks, she had still to remain in the hospital under treatment, after the expiration of the minimum term of thirty days, until pronounced cured by the medical officer in charge of the institution, but not for longer than one year.

On September 1, 1910, the Page Law went into effect, and at once a storm of protest arose which was directed exclusively against the medical examinations of the convicted prostitutes. Naturally, the greatest part of these protests originated in the various women's rights organizations; but, strangely, "The Society for Sanitary and Moral Prophylaxis" took a stand in

opposition to the law, and carried on a lively campaign against the same. The County Medical Society also through its committee on legislation took a position in opposition to the law. I have been told that the committee on legislation of the above society held a number of meetings to discuss the pros and cons of the matter; but I am not aware that the committee invited the opinions of the members of the society upon the question, before making its decision to oppose the law. It may possibly have done so, but I can find no evidence to that effect. It seems to have been sufficient unto itself without getting the opinions of experts upon both sides of the matter under consideration. It was to be expected that the women's rights organizations would take such a stand since, upon the surface, it might appear that the female sex was being discriminated against; but I believe that we had the right to expect something different than an energetic campaign against the provisions of a bill whose object was to attempt to get at the chief offender in the spreading of venereal diseases—before these measures had received a trial—from a society whose objects appear to be, on the surface, not merely to preach morality, but also to work energetically for a sanitary prophylaxis of venereal diseases. Had they waited with their opposition until the measure in question had been tried for a reasonable length of time, and been found wanting, then they would not have laid themselves open to criticism. As it was, however, they seemed to have lost sight of the fact that the measure was one which was intended to be sanitary in its objects and not punitive in character, and, therefore, I feel that the organizations—which, of course, follow the opinions of their leaders in taking a position—laid themselves open to the criticism that they have sacrificed the right to the claim that one of their aims is sanitary prophylaxis.

The Department of Health it seems to me was not particularly anxious to have the law given a fair trial. The examinations were made by female physicians, appointees of the Board of Health, who were everything else but specialists in the line of work required of them. Thus, for instance, I asked one of the physicians on duty at the night court, from what sources she took the secretions which were to be examined for the presence of gonococci. She answered me that she took scrapings *from the vaginal wall*, and if there was a visible discharge from the cervix, she also made a specimen of this. I asked her whether she did not also make a scraping from the urethra, and she



answered that she had not done this, and had never done it in any case. Although she had, at the time I spoke with her, already been making the examinations at the night court for three weeks; the Department of Health, so she stated to me, had given her absolutely no directions concerning the manner in which the examinations were to be made. She and the second physician on duty at the time were making the examinations according to their own sweet will. When I asked her what was her method of examination for the presence of syphilis she told me that she examined the mouth and the pharynx and the cervical glands. The other parts of the body were not examined at all, and no specimens were taken for examination for the presence of *spirochaeta pallida*. This preposterous and superficial method of examining for symptoms of syphilis was employed, and the examinations made in a room lighted only by a few small electric lamps. Naturally it followed that she had, as she told me, discovered *not a solitary case of syphilis* during her entire time of service at the night court, and that she had discovered only isolated cases of gonorrhea. The specimens taken were, in part, examined in the laboratories of the Department of Health and in part in the court buildings.

Between September 1, 1910, and December, 1910, when the examinations were interrupted—as a result of the declaration of Judge Bischoff that the examinations were unconstitutional, because of the fact that the testimony of an individual bearing no relation to the court was a factor in the determination of the sentence and a maximum punishment specified which was greater than that otherwise specified by the penal code for similar offenses—there were in all 279 convicted prostitutes examined. Of these eighty-one (29 per cent.) were declared to be infected with gonorrhea; *not a single case of syphilis, or chancroid was discovered*. These data are taken from a report given to me by the Department of Health.

That such examinations, carried out in the manner in which they were done at the Night Court, must be absolutely valueless requires no further comment, since, owing to the fact that they were entrusted to physicians who knew practically nothing of the usual and necessary methods for the detection of these diseases, nothing else could be expected.

On May 12, 1911, after the Appellate Division of the Supreme Court had again declared the examinations to be constitutional, they were again begun, and during a part of this time they were

entrusted to a rabid opponent of this law—also an ardent women's rights advocate—and from that date until May 26, 1911, 105 women were examined, and only five found to be diseased.

After this the case was taken to the Court of Appeals, which declared the examinations to be unconstitutional. As a result the examinations were definitely suspended on June 16, 1911.

Whether we may hope for a law along the lines of the Page Law, which shall be formulated in such a manner that it shall be constitutional, is questionable—at least for the immediate future—for I doubt whether there is a representative to be found who would be brave enough to take up the fight against the hypocrisy and fanaticism upon these topics, which are the rule here in this country.

Before me lie the figures of the arrests for prostitution and solicitation, in the year extending from September 1, 1910—date of the institution of the examinations under the Page Law—to May 31, 1912, which data were kindly furnished me by Mr. Frederick H. Whitin, Chairman of the "Committee of Fourteen," who gathered them with the greatest care. The list contains also the number of finger-prints. It is as follows:

Finger printed	Individuals	Finger-prints taken
Once.....	2087	2087
Twice.....	713	1426
3 times.....	384	1152
4 times.....	211	844
5 times.....	142	710
6 times.....	73	438
7 times.....	38	266
8 times.....	13	104
9 times.....	7	63
10 times.....	3	30
11 times.....	2	22
12 times.....	1	12
	3674	7164

Disposition of the above 7154 convicted cases.

Workhouse.....	5138
Fines.....	980
Probation.....	617
Bedford.....	86
Magdalen.....	52
Good Shepherd.....	69
House of Mercy.....	6      213
Other Disposition .....	216

7164

*In other words, there were during the period in question, 3674 prostitutes "inscribed" on the lists, since the taking of the finger-prints constitutes a positive and real "inscription" system and, moreover, one from whose lists the prostitutes cannot again be stricken, since the finger-prints are preserved in the minutes of the trial, and are kept among the archives of the court and of the police.*

Three thousand, six hundred, seventy-four women were arrested, 7164 times; of these 713 twice; 384 three times; 211 four times; 142 five times; seventy-three, six times; thirty-eight, seven times; thirteen, eight times; seven, nine times; three, ten times; two, eleven times; and one, twelve times.

The list of the arrests and the disposition of the case between September 1, 1910, and August 31, 1911, follows:

	Dis-charge.	Work-house	Fine	Pro-ba-tion.	Correc-tional Institutions.	Rescue homes	Prison hospi-tal	Other-wise dis-posed of
September, 1910:								
First arrests.....58	0	27	9	0	0	1	21	0
"Repeaters".....0								
October, 1910:								
First arrests.....89	1	47	6	4	0	0	32	0
"Repeaters".....1								
November, 1910:								
First arrests.....184	2	144	3	11	2	1	26	0
"Repeaters".....6								
December, 1910. (Dur-ing this month the ex-aminations were sus-pended.)								
First arrests.....147	4	138	13	16	1	1	0	1
"Repeaters".....27								
January, 1911:								
First arrests.....278	5	225	67	32	5	3	0	3
"Repeaters".....62								
February, 1911:								
First arrests.....207	3	180	67	17	13	7	0	5
"Repeaters".....85								
March, 1911:								
First arrests.....242	3	244	105	15	3	4	0	7
"Repeaters".....139								
April, 1911:								
First arrests.....279	4	280	119	35	2	4	0	2
"Repeaters".....167								
May, 1911. (Toward the end of this month the examinations were again begun.)								
First arrests.....223	0	190	136	29	0	3	11	0
"Repeaters".....147								
June, 1911. (Examina-tions again suspended on the 16th.)								
First arrests.....130	1	196	16	9	0	6	9	0
"Repeaters".....107								
July, 1911:								
First arrests.....276	2	416	100	11	0	9	0	15
"Repeaters".....277								
August, 1911:								
First arrests.....229	1	362	86	35	11	1	0	28
"Repeaters".....295								
Totals.....	26	2449	727	214	38	40	99	62
First arrests.....2342								
Repeated ar-rests.....1313								

Mr. Whitin has further informed me that, during October, 1911, 550 women were arrested for loitering and solicitation, of which number fifty were discharged, and that during November, 1911, 436 arrests were made for the same offenses, with seventy-four discharges, and that 90 per cent. of the arrests made under the above charges were really made because of prostitution. He also tells me that the large majority of the fines is now \$10, and that an average \$8 fine would not be too high a figure.

If we study more closely the list of arrests we will at once be struck by two facts: first, the great difference between the number of arrests during the period in which the medical examinations took place, and that in which they were not made; and, secondly, by a great difference in the number of "repeaters" during the same periods. Thus, there were, during the three months between September 1, 1910, and December 1, 1910, 331 first arrests and *only seven repeated arrests*, or on an average  $110 \frac{1}{3}$  to  $2 \frac{1}{3}$ , while in the five subsequent months, December, 1910, to April, 1911, during which examinations were not made, there were 1154 first arrests, and 480 repeated arrests, or on an average of  $230 \frac{4}{5}$  to 96. In other words, there were on an average more than twice as many first arrests and *forty times the repeated arrests*, during those months in which examinations were not made.

Various explanations might be given for this difference—it is not to be supposed that the total number of prostitutes varied so greatly and so suddenly, or that the prostitutes were banished from the city. That they did, however, in great measure keep off of the streets and did not so openly and shamelessly follow their trade, was made clear to everyone who knows the streets of our city. They knew that, should they be found venereally diseased, it was not longer dependent upon the will or the whim of the judges to fine them a few dollars or to send them for a few days to the workhouse, and for that reason the older and more hardened prostitutes took care not to subject themselves to the danger of compulsory hospital treatment. Another view might be that they were perhaps more ready to bribe the police officers, and thus to escape arrest—that is, of course, possible, for anyone at all acquainted with the conditions existing in regard to prostitution in this city, must know what a rich source of income for some of the officials, these individuals are. But in the present case, I believe this not to have been the reason, for, during the months in which the examinations took



place, solicitation was far less evident than at other times. A similar fluctuation is to be found during May and June, 1911, but this is less evident, since the examinations were again taken up only in the middle of May, and were again interrupted about the middle of June. Furthermore, the prostitutes were aware, during the latter period, of the fact that the Department of Health, owing to the fact that the case had been brought before the Courts of Appeals, did not any longer take the matter quite seriously, and also that the judges were no longer quite sure what position they were to take with regard to these cases.

The opponents of the Page Law argued that this law constituted the first step toward reglementation of prostitution, and that it advocated a double standard of morals. They also claimed that it constituted a beginning of a system of "inscription" of the prostitutes, *but they forgot that the finger-print system constitutes the surest and most exact system of registration, or inscription of the prostitutes, and that this system was already in force prior to the passage of the Page Law, and that, although the sanitary provisions of the bill have been abolished through the shrieks of the fanatics, the inscription of prostitutes still remains in force, since the finger-print system is still in use at the present day.*

At once after the new law was put into force, the various organizations of women's rights advocates had some of their members watch the method of the carrying out of its provisions, and soon there appeared in various publications what purported to be reports of the procedures at the night court, and the world was regaled with accounts of the brutality which was used toward the poor and much abused prostitutes, both in the courts and at the examinations, and the proceedings were likened almost to the tortures of the Inquisition. Women were reported to be dragged from the platform before the judge, and dragged into the prison, where they remained, weeping and moaning; and the reports had it that the convicted prostitutes struggled ineffectually against the brutal desecration of their persons through the examinations by physicians of their own sex; yet one of the examining physicians told me personally that, during her entire term of service, in only a few isolated cases did the women make any objection whatsoever to the examinations, and that of those objecting one individual was intoxicated, another objected because she had been told *she would be operated upon*, and that this woman, as soon as the nature of the examination was ex-



<i>Sentence:</i>	<i>First Offenders:</i>	<i>Repeaters:</i>
Workhouse 5 days.....	71 (31 per cent.)	105 (19 per cent.)
Workhouse 10 to 25 days.	27 (12 per cent.)	297 (52 per cent.)
Workhouse 30 days and over.	8 ( 4 per cent.)	66 (11 per cent.)
Cumulative sentence..	33 (14 per cent.)	66 (11 per cent.)
Fines.....	18 ( 7 per cent.)	9 ( 2 per cent.)
Probation.....	58 (24 per cent.)	14 ( 2 per cent.)
Institutions.....	7 ( 4 per cent.)	14 ( 2 per cent.)
Other dispositions.....	8 ( 4 per cent.)	4 ( 1 per cent.)

*Convictions:*

(Direct solicitation), first offenders 330 (50 per cent.)  
 "Repeaters" 336 (50 per cent.).

<i>Sentence:</i>		
Workhouse 5 days.....	76 (23 per cent.)	56 (16 per cent.)
Workhouse 10 to 25 days. ....	32 (10 per cent.)	143 (43 per cent.)
Workhouse 30 days and over.....	19 ( 3 per cent.)	62 (17 per cent.)
Cumulative sentence..	36 (10 per cent.)	32 ( 9 per cent.)
Fines.....	16 ( 5 per cent.)	5 ( 2 per cent.)
Probation.....	122 (37 per cent.)	16 ( 5 per cent.)
Institutions.....	33 (10 per cent.)	20 ( 7 per cent.)
Other dispositions.....	6 ( 2 per cent.)	2 ( 1 per cent.)

I am in possession of a communication, from a gentleman who is in a position to get reliable information upon this topic, who said, some time ago: "Have you observed the re-establishment of the segregation of brothels in West ——— Street? It is stated that they pay \$200 a month for the privilege of existence. It is stated that the segregation is with the consent of the \* \* \* \* \* —interesting, if true."

Magistrate Corrigan recently made the public statement that the conditions at present in this city are just as bad if not worse than formerly, and I believe he is right. Only the other day I was informed by another man, in a position to know whereof he speaks, that a certain police captain in this city, on the East side, is collecting in tribute, from prostitutes and their pimps, from brothels, policy joints, gambling houses, etc., the sum of

\*\*\*\*\* A prominent city official is here named.

\$10,000 monthly. It would be interesting to know how much of this money goes to the men "higher up," and how much is being spent, in addition, to oppose such legislation as would have for its object the adoption of measures which might possibly help to limit the activities of those who are chiefly responsible for the—at present unchecked—spread of venereal diseases in this city.

I feel confident that if some of our most prominent exponents of "moral prophylaxis" in this and other cities of this country were *personally* to study this problem of the possibilities of a sanitary control of prostitution, from points other than a comfortable chair before a desk equipped with the publications of so-called authorities, they might be brought to view the question from an entirely different point of view than that which they now hold.

One of those whose official activities bring him into close touch with the question of vagrancy and prostitution, and who is, perhaps, among those best fitted to judge, is Mr. Whitin, who has been previously mentioned in this article. In reply to a question by me, concerning his candid opinion of Clause 79 of the Page Law, he states as follows:

"You ask my candid opinion, with privilege to quote me regarding the present situation as compared with that which might have been had Clause 79 of the Page Law not been declared unconstitutional. The opinion, it must be remembered, is of one who was favorable to that clause. It is my opinion that its reasonable enforcement would have cleared the streets of women who loiter and solicit and, granting proper hospital facilities, would have resulted in vastly better conditions than at present. It must be remembered that our existing system of treatment is seriously handicapped by our antiquated work-house which was never intended for the commitment of many of the persons of the class now sent there. I do not believe the enforcement of Clause 79 would have resulted in efforts toward a legalization of prostitution. In my opinion, the proper method to have been pursued by those opposed to the clause would have been a positive remedy rather than the negative which they successfully accomplished. They should have made an equally strong demand for an extension of the principle of the law to both sexes: to have made it an equal crime for any person, male or female, venereally diseased to be found in such a place or in such a relationship that no reasonable doubt could exist



that he or she was about to subject another person to contagion; that any person so found should be subject to the necessary physical examination."

What is possible, in the line of a control of prostitution and venereal diseases, in a small city, or one whose population is homogeneous, is difficult, or impossible, in a city like New York, with its millions of inhabitants, drawn from all quarters of the globe, and possessing all of the virtues and vices of its various component races. I feel confident that, when this topic shall be studied from the point of view of sanitary prophylaxis, as well as from the purely moral point of view, we shall eventually in this city have to adopt some measures for the control of its prostitutes and prostitution, similar in their character to those which are employed in some of the European countries. Our authorities might with profit study the laws in this regard which Denmark possesses. With some modifications—necessitated by the difference in size and characteristics of the population—they might prove a valuable help to us in our fight against the spread of venereal diseases. Certainly the present plan, which contents itself with preaching morals and continence—both admirable things, when they are, or can be carried out—and entirely neglects to take into account the existing conditions, can only bear fruit—if at all—in the dim future, and, meanwhile, the poison is allowed to spread unchecked.

10 WEST SIXTY-FIRST STREET.

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## TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

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*Meeting of May 14, 1912.*

*The First Vice-President, GEORGE G. WARD, M. D., in the Chair.*

DR. H. D. FURNISS read a paper on

COMPLETE REMOVAL OF THE URINARY BLADDER FOR CARCINOMA,  
AFTER PRELIMINARY BILATERAL LUMBAR URETEROSTOMY.

DR. H. D. FURNISS reported the following case: The patient, a school teacher fifty years of age, was first seen by Dr. Furniss on February 19, 1912. She had one child fifteen years of age and her previous history was negative. Last summer she had had some bladder irritation and a moderate hematuria. This lasted for two weeks and cleared up under some form of medication. For

the past three months the patient had been having frequent and painful urination. The urine was passed easier when the patient was standing. When sitting there was marked tenesmus upon attempt to urinate. Of late at times there had been some rectal protrusion from straining. The urine had been very turbid and contained enough blood for the patient to notice it. She had lost in weight and strength. Cystoscopic examination showed a more or less smooth rounded mass arising from the right side of the bladder above and to the outer side of the urethra. At its base it appeared to be the thickness of a thumb and extended inward for an inch and was broader three-quarters of an inch from the base than at the base. The trigonum was very red, infiltrated, and thrown into folds. A diagnosis of primary carcinoma of the bladder was made. The patient was not seen again until April 10, when she reported that the bladder tenesmus had been very severe and that she had to void almost constantly and that there had been a rectal prolapse. The urine had become ammoniacal and caused severe burning and eczema of the thighs. Examinations *per vaginam* showed a mass the size of a duck's egg in the bladder region, most of it lying to the right of the median line. Examination with the water cystoscope was impossible. With the Kelly cystoscope practically nothing was seen but a mass covered with phosphates. On April 12, a bilateral lumbar ureterostomy was done, a ureteral catheter being tied into each ureter. Both ureters were moderately dilated. A silk ligature was placed at the upper angle of either wound, passing through the external coats of the ureter. The next day urine from both ureters showed a moderate amount of pus, a few epithelial cells and a moderate ring with Heller's test. On the left side, a fistula into the ureter occurred at the site of the retaining suture. To close this a catheter was left in for several days; this caused an infection of the renal pelvis which was clearing up under irrigations with boric acid solution. On April 27, the bladder was moderately distended with boric acid solution and a ligature placed around the urethra. A median abdominal incision from the symphysis to the umbilicus was made. Both internal iliac arteries were ligated, the peritoneum divided in the median line over the posterior surface of the bladder as low as the anterior culdesac and the bladder peeled out with very little hemorrhages. Had the ovarian arteries been ligated and the collateral circulation through the vaginal branches of the uterine thus controlled, the operation would have been almost bloodless. When the bladder had been so separated that the only attachment was the urethra, the vagina was opened from above under the urethra and then by continuing the incision around the urethra through the vagina, the whole bladder and urethra were removed. When the operation was almost finished a small opening was accidentally made into the anterior wall of the bladder through which some foul fluid escaped. An iodoform drain was placed in the anterior

culdesac, passing through the space from which the bladder was removed and into the vagina. The abdominal wall was closed in layers. The abdominal wall broke down for there had been extensive sloughing of the fascia. Aside from this and the infection of the left kidney which was under control, the patient had done well. The specimen which was shown was prepared by Dr. Sondern. The bladder was hardened and an incision was made through the under side. Springing from the right side of the bladder, above the urethra was a large growth, the size of a duck's egg, which in the section of the bladder was so divided that a small portion of the growth was on one side and the greater portion on the other side of the specimen. Through failure to make request for a microscopical examination, the specimen was mounted in jelly and put into glass without removing a piece for examination. No glands were felt in the pelvis at the time of the operation.

#### DISCUSSION.

DR. E. W. PINKHAM said that without wishing to be considered a doubting Thomas, his inspection of the specimen shown by Dr. Furniss did not reveal any absolute reason for making a diagnosis of carcinoma without the aid of the microscope. He had seen non-malignant papillomata quite as extensive, having practically the same appearance, and giving rise to like symptoms.

The speaker said he was rather surprised to hear that Dr. Furniss had resorted to extirpation of the bladder for a growth of this kind without microscopical confirmation of malignancy or before trying the effects of fulguration, of which method Dr. Furniss was such a great enthusiast. He recalled a case in an elderly man—an undoubted case of carcinoma of the bladder—where the growth originated in the prostate. The patient had already been subjected to an open operation, when a section of the growth had been removed and the diagnosis of carcinoma had been confirmed microscopically. Very little relief followed the drainage that had been instituted at this operation, and for the past six weeks the man had been treated by the fulguration method, with marked improvement in his symptoms. The bleeding had been checked, and the bladder now held only one ounce of residual urine. This was in a case of undoubted carcinoma, and Dr. Pinkham said he was surprised to hear that Dr. Furniss did not give the fulguration method at least a trial in the case he reported.

DR. FURNISS, replying to Dr. Pinkham, said that while he had great faith in the fulguration method, he believed it had its limitations. He could recall a number of cases of papillomata of the bladder which did beautifully under fulguration, and in one instance where the diagnosis lay between carcinoma and papilloma, the hemorrhage was controlled, although the tumor



had continued to increase in size. In the case under discussion, from the size of the growth and its rapid increase, he was convinced that he was dealing with carcinoma. The fact should also be borne in mind that the majority of cases of papillomata of the bladder were apt to prove malignant eventually, and in this particular instance, any palliative operation like fulguration would have been foolhardy and a loss of time. Fenwick, after a very extensive experience with bladder growths, made no attempt to remove them alone unless they were readily accessible and on the free portion of the bladder. For basal infiltrating growths he recommended cystectomy with lumbar implantation of the ureters. A very important point in connection with complete removal of the urinary bladder was the best disposition of the ureters. By implanting them in the rectum, infection was almost certain to occur. In his own case, where he had resorted to a bilateral lumbar ureterostomy, an infection of the left kidney had taken place as the result of leaving the catheter *in situ*. This infection was improving under treatment, and as soon as the patient was well enough, Dr. Furniss said he expected to have a band made, holding two silver cups, draining into a urinal, according to the idea suggested by Watson and carried out by Roosing.

DR. H. N. VINEBERG read a paper on

STREPTOCOCCEMIA DUE PROBABLY TO STREPTOCOCCIC INVASION  
OF A SUBMUCOUS FIBROID.\*

DISCUSSION.

DR. GEORGE G. WARD said the case Dr. Vineberg referred to was reported by him three or four years ago at a meeting of this Society. The patient suffered from a very virulent infection, and died a few hours after the operation. Upon autopsy, the abdomen was found invaded with streptococci, and as these were also found in the uterus, they were led to believe that the latter was probably the source of the infection, when the cervix was cut across in doing the supravaginal hysterectomy.

DR. H. G. BOLDT presented the following cases.—

UTERUS RESECTED AFTER UNSUCCESSFUL RESULT FOLLOWING  
AN INTERPOSITION OPERATION FOR PROCIDENTIA.

A. C. had been operated upon sometime previously by the method devised originally by Wertheim, with the result that the patient suffered more after the operation than before it. The body of the uterus, with the anterior vaginal wall protruded from the vulva and caused the patient unbearable distress, because it was an impossibility to keep the uterus within the vagina. The colleague who did the operation, had a one absolutely perfect technical work, as regards the interposition but

\*For original article, see page 375.



had overlooked the fact that because of the large size of the uterus, it would likely again protrude. The operation consisted of again making a longitudinal incision along the entire anterior vaginal wall, separating the adhesions and resecting the entire anterior part of the uterus to the uterine cavity, only retaining enough of the organ to act as a lever. The remaining part was then shaped and reattached to the anterior wall, after it had been sufficiently excised. Then the pelvic floor, which had been impaired by the seven confinements through which the patient had passed, was also properly built up; the previous operator having failed to get the muscles of the pelvic floor united. The result now seems satisfactory.

#### PAN-HYSTERO-SALPINGO-OOPHORECTOMY FOR BILATERAL TUBO-OVARIAN ABSCESS.

The chief interest in the case centers in the unusual distortion that the bladder had undergone. It was drawn up nearly to a line midway between the symphysis and the umbilicus, and it was extensively adherent to the intestines.

#### PAN-HYSTERECTOMY FOR A MYOMA OF THE CERVIX.

These are undoubtedly the most difficult myoma operations, from the technical point of view. Moreover, from their location, they also often cause, most excruciatingly painful pressure symptoms, as was also the case in this instance.

#### LEFT TUBAL PREGNANCY, REMOVED PER VAGINAM.

While, as a rule, I prefer the abdominal route for such operations, yet occasionally, these patients may be satisfactorily operated upon per vaginam. I prefer that route in very obese women, if the pelvic cavity is readily accessible from below.

#### DISCUSSION.

DR. RALPH WALDO had performed this operation in quite a large number of cases, and wished to lay a great deal of stress on the importance of what Dr. Boldt had said. In a certain percentage of these cases, the uterus is very much elongated, and usually its cervical portion is the part most increased. The fact that recent operations have proven more successful than those done formerly he believed is largely due to the fact that a considerable portion of the uterus was taken away, and that the upper section of the uterus was brought under the bladder.

Another essential point was that a good, muscular perineal body should be built up. In most of these cases, this support is entirely absent, although there may be a fairly good skin perineum.

If these methods were followed, in a very large percentage

of cases the prolapse would be cured much better than by the older methods of fixation and suspension from above.

DR. FURNISS thought that if the uterus was replaced in these cases, and the patients kept in bed for a time, it would materially decrease in size, and the operation could then be done more satisfactorily and with much better results. Dr. Watkins, in his modified operation, had advised removing a portion of the anterior wall of the uterus in cases where the hypertrophy was very pronounced.

DR. VINEBERG said that as he was the first to do this operation, in this country he was naturally interested in it. He had never seen a case where the uterus had come out after vaginal fixation, and he thought the error often made in doing this operation was that the sutures were not properly placed. In these cases, the difficulty we often had to contend with was a very large uterus, and he recalled three instances, seen within the past six months, where the uterus was so large that he was obliged to do a rather high amputation through the vagina, using the cervix as a cushion and in every one of these cases he got a very good result; whether it would be permanent or not he did not know.

Where one had to deal with an enlarged, fibroid uterus and a badly lacerated cervix, of course the cervix could not very well be left, and then the question came up whether to do what Dr. Boldt had done in his case, and excise a portion of the uterus, leaving the remainder to serve as a support to the bladder. Dr. Vineberg said he had done this in two or three cases without great success. Nor, he added, did the plan appeal to him, of cauterizing so as to destroy the endometrium.

DR. PINKHAM said that at the Woman's Hospital they had done many of these interposition operations, and during the past three or four years they had had quite a series of them. In some of the cases the uterus had been very large, and under those conditions the patients had received preliminary treatment for three weeks or longer. He recalled one private case which he treated for at least two months with little or no diminution in the size of the uterus, and then he did the operation which Dr. Cleveland advised, taking out a big, wedge-shaped piece, approximating the two sections, and then doing an interposition operation. He had now followed this method in five cases, with good results. The speaker said he did not know who originated this operation.

DR. BOLDT, in closing, could assure Dr. Vineberg that the gynecologist who did the original operation in this case made an absolutely perfect approximation to the vagina. The operation was well done; the uterus was well attached to the vagina, and the failure was simply due to the large size of the uterus.

So far as the pelvic floor was concerned, while it was relaxed, he doubted whether that had anything to do in this instance with the prolapse of the body of the uterus.

Up to the present time, in this case, Dr. Boldt said, the result

of his operation seemed to be perfect. Some surgeons, under those conditions, took out the entire uterus in preference to removing a wedge-shaped section.

DR. GEORGE RYDER read a paper on

PRIMARY UTERINE INERTIA.\*

DR. O. P. HUMPTON read the second paper on

PITUITRIN IN UTERINE INERTIA.†

DISCUSSION.

DR. J. CLIFTON EDGAR had been much interested in listening to these two most excellent papers by Dr. Ryder and Dr. Humpstone. He was very closely in accord with what the former had said in his summary of primary uterine inertia, and personally, in his treatment of that condition, he was less aggressive today than he had been a few years ago, having come to the conclusion that a waiting policy was a very good one in dealing with those cases. It was impossible, of course, to lay down any one line of treatment, as the causes of the condition varied so greatly. In certain instances, as Dr. Ryder had said, it was the result of a low innervation of the uterus, and the speaker had in mind two such cases occurring in sisters. Any obstetrician of experience could recall cases of this type. There was also another type, the woman who had two or three children, and then, after a long interval, perhaps late in the thirties, again became pregnant. Such a woman may have the worst kind of primary inertia.

Dr. Edgar said he would hesitate to accept the teaching of Cesarean section for primary uterine inertia, without obstruction. Provided the membranes were unruptured, a waiting policy should be followed. He recalled such a case where the woman was allowed to go on for days and days; she had a few nights sleep, and then one morning he found full dilatation, and after simple rupture of the membranes she had a practically painless labor. In a case where the membranes had ruptured, however, he did not think we could wait for many hours.

Dr. Edgar thought there was something more to the treatment of uterine inertia than high forceps or version. Personally, he was a great believer in massage of the fundus. He recently saw the wife of a physician who was suffering from this condition of primary inertia, as had her sister before her. It was a typical case. Bags were put in and pituitrin was tried, but without effect. The nurse was then instructed to massage the fundus, and whether as the result of that or as a late effect of the pituitrin, fairly strong labor pains soon set in, and the woman delivered herself spontaneously in spite of a contracted outlet.

\* For original article, see page 365.

† For original article, see page 357.



The speaker said another feature that had impressed him strongly in connection with some of these cases was their uncertainty. True uterine inertia might come on for a couple of days; then, after full dilatation, the pation might pull herself together and the labor terminate spontaneously. This was a strong argument in favor of a waiting policy, providing the membranes were unruptured.

Discussing Dr. Humpstone's paper, Dr. Edgar said that about a year ago he obtained a supply of pituitrin, and in the beginning he felt very enthusiastic about it. He used it freely, both in hospital and private practice, and he thought that here we had something which would replace ergot, or at least be more satisfactory, because it was less painful to inject it. In a large number of cases it acted well, and in giving it a trial he was mainly influenced by the reports from the German clinics. Personally, he had never been able to see that pituitrin initiated labor, either with the bougie or bags or without them. In his experiments with the remedy, he had found the English preparation the most certain, and while it had given him the best results, it could not be depended on. Even in repeated doses he had seen it given without effect, and in connection with its use he thought a note of warning should be sounded in that there was a possibility of its producing premature separation of the placenta. It was still an uncertain factor, and we did not know how it was going to act. It had been remarked by others and he himself had observed it produce such vigorous contractions of the uterus that the child was born asphyxiated, and he had also seen meconium appear in the uterine discharges, which could only be ascribed to the vigorous action of the pituitrin.

In closing his remarks, Dr. Edgar said he was not prepared to be as optimistic as the reader of the paper in regard to this new remedy, and he believed that ergot, where we wished to increase the uterine contractions—only, of course, in non-obstructive cases—was just as efficacious and just as prompt in its action as pituitrin.

DR. R. L. DICKINSON said that in a case of typical uterine inertia which came under his observation, where the cervix was fully dilated and where the fundus had been faithfully massaged without effect, he had called Dr. Humpstone in consultation. The patient was given two ampules of the Parke, Davis & Co. preparation of pituitrin, and after the second dose she had a spectacular series of pains, and completed the labor spontaneously. Nothing could have been more graphic than the effect of the remedy in this case.

DR. HENRY C. COE said that some of the cases of so-called uterine inertia were really cases in which pains were absent because the time had not yet arrived for the child to be delivered. This was not infrequent when uterine contractions and beginning dilatation had actually begun. He recalled the case of a multipara who sent for him every Saturday night three times and



was apparently soon to be delivered. The third time was the real thing.

In dealing with primary uterine inertia, Dr. Coe said he still favored some of the old-fashioned remedies. He believed in strychnia in 1/40-grain doses, administered as a routine practice during the last two months of pregnancy, and he had never seen any injurious results from it. He also believed in quinine and castor oil, given in sufficiently large doses. He had seen 20 grains of quinine and a full dose of castor oil effect satisfactory results in such cases as were described by the reader, and he agreed with Dr. Edgar that when there was no real obstruction, no attempt should be made to hurry matters. A full dose of opium often causes a complete change in the situation.

Dr. Coe said that he had never seen a case of primary uterine inertia in private practice in which he had felt inclined to urge Cesarean section, and he had yet to meet with a husband, who would permit the operation, even in cases of true dystocia, where it was clearly stated that the child would probably be sacrificed. This, of course, was only his individual experience.

DR. R. B. TALBOT said that a number of years ago he was called in consultation to see a woman whose cervix was dilated to about the size of a half-dollar, when the pains suddenly ceased. This was on a Sunday. After waiting all day he advised her to go out for a carriage ride, and it was not until the following Saturday that she was delivered after a normal labor.

In some of these cases, the speaker said, we simply did not give the patient sufficient time. If we did this, instrumental or other help could often be avoided. He recalled a case on the upper East side where he found two physicians waiting for a child to be born, and insisting that something had to be done. They were assured that it was simply a question of time, and in about six hours the woman was delivered without instruments.

As to the use of drugs to hasten delivery, Dr. Talbot thought that some of the old-time remedies were about as efficacious as any now in use.

DR. C. G. CHILD said he was much interested in the report of the five cases in Dr. Ryder's paper, but he did not think they could be considered cases of true uterine inertia. They were cases where labor had not yet begun. It was difficult, at times, to say when a patient was at term, and in Dr. Ryder's cases he saw no sufficient reasons for the induction of labor. He may have misunderstood the paper, and he asked Dr. Ryder, in summing up, to state what the indications were for inducing labor in his cases.

According to the remarks made by Dr. Edgar, we should act promptly in inducing labor after the membranes had once ruptured, and yet, Dr. Child said, he had never been able to bring himself to that way of thinking, in the absence of more positive indications. He had at times permitted his patients to go for two weeks or even longer after rupture of the mem-

branes, and the labor had eventually started spontaneously. He recalled to mind two cases from his practice. One which he was asked to see for another physician, a primipara about at term, where the membranes had ruptured spontaneously, but no pains had started. He telegraphed to her physician, who was out of the city, telling him of the condition of his patient. Immediately on his return to town this physician started in to induce labor finally ending up with a forceps operation and a dead baby. The second case seen at about the same time, also a primipara, near term with sudden rupture of the membranes without pains, was allowed to go for two weeks after rupture of the membranes, when labor started spontaneously and went on to a low forceps with the delivery of a live baby. The question, was how long it was safe to wait after rupture of the membranes, and what were the indications for hastening labor under such conditions? he felt that this was yet to be answered. He considered that pretty positive indications should exist before interference was justified in these cases, and had little patience with the "frenzied obstetrics" such as he mentioned above. Uterine inertia he understood to be a deficiency of uterine contractions in labor, and not the non-appearance of labor.

DR. DICKINSON said that with the fetal heart as a guide, he thought it safe to wait eight or ten hours after the membranes had ruptured. After twelve hours, however, most of us begin to feel some apprehension concerning the child.

DR. EDGAR said that under the conditions referred to by Dr. Child, where there was moderate dilatation and some of the water was retained after rupture, he would not hesitate to wait several days, allowing himself to be governed by the fetal heart, the condition of the mother and the absence of meconium in the discharges. In many instances, the rupture was high up, and there was a good deal of water left about the child's body. In his previous remarks he had in mind those cases where the head was in the pelvis and there was pressure on the bladder and surrounding parts. When the head was floating and there was an absence of pressure, it was unnecessary to do anything, providing the fetal heart was not too rapid.

Dr. Edgar said there was one point he wished to refer to in connection with true uterine inertia, and that was the dilatation of the cervix. In true primary inertia, after we had some pains—not exhaustive—it might be advisable, under an anesthetic, to resort to manual dilatation of the cervix, enough to remove the barrier at that point, and then leave the patient alone. This often had a remarkable effect in stimulating the uterus to effective pains. He also believed that there was a place for ergot in uterine inertia where the passages were wide open, and he could see no more objection in giving ergot than pituitrin under these circumstances.

DR. RYDER in closing said he was much interested in what Dr. Edgar had said, especially because a year ago he, had tried

unsuccessfully to get him to write a paper on non-obstructive uterine inertia for the Society of the Alumni of the Sloane Hospital. He had thought in writing on the subject himself, Dr. Edgar might discuss it, and thus give his ideas after all.

As to the advisability of performing Cesarean section in non-obstructive inertia, Dr. Ryder said that he thought at times it was distinctly indicated. This was especially true in dry labors where the liquor amnii had drained off and the pains had ceased entirely. Long delay means almost certain death to the fetus. Version was often impossible and forceps difficult and dangerous. The third case in the series illustrated that Cesarean section might have saved the fetus. In cases where the membranes were unruptured, and the patient was in good condition, but simply without labor pains, he saw no indication for Cesarean section. The thing to do, of course, was to wait for labor pains to start again, when they would often prove sufficient. Still it must be remembered there was a limit to the length of time one should wait. And one might easily imagine a case of persistent inertia, and persistent lack of response to attempted induction of labor, where a Cesarean section would be far preferable to the attempted delivery of a fetus much too large for the pelvis.

Speaking of massage of the fundus for inertia, Dr. Ryder said he had often used it, but never as suggested by Dr. Edgar, with relays of nurses. This would seem to be well worth trying. He had also tried manual dilatation of the cervix for inertia to some extent, but never quite in the manner described by Dr. Edgar.

As to the use of ergot in inertia, he had never used it before the end of labor, but he saw no great objection to using it thus, provided the cervix was fully dilated and there was no other obstruction, but under these conditions, forceps would answer the same purpose.

Taking up Dr. Coe's criticism that many of the cases quoted were not true cases of inertia at all, but simply delayed labor, the speaker said that in all the cases cited except two, actual labor pains had started and had progressed for a time sufficient to increase the dilatation of the cervix. The two exceptions had been classed as inertia because they had resisted so stubbornly attempts at induction of labor.

In regard to the use of strychnine to which Dr. Coe had referred, Dr. Ryder said he often gave this drug, as advised by Dr. Edgar in his text-book, in small repeated doses for a month or so before labor. As to castor oil, each of the cases cited had received a full dose, often more than one, before other measures were attempted. This was almost a routine. Quinine he had found of little value, possibly because he had not used sufficiently large doses.

In reply to the question of Dr. Child as to how he knew that the cases he had reported were at term, the speaker said that theoretically by Naegele's rule they were all at or within two weeks



of term; the fetus in each case seemed large, and the cervix was soft and admitted two or more fingers. His object in trying to induce labor was to give the woman an easier time, before the fetus grew too large.

Recently he had not been inducing labor so frequently, only where there was some very special indication, such as albuminuria. Induction of labor should be deferred in cases where there was probability of inertia and should not be persisted in.

As to letting patients go on for days undelivered after the membranes had ruptured, Dr. Ryder said he did not believe this a good plan; rather he had followed the rule in force at the Sloane Hospital, of waiting only 24 hours and then inserting a bag. He recalled quite a number of cases admitted to the hospital, where the membranes had ruptured and the liquor amnii had drained off several days before labor started, and where seemingly as a consequence of this, the patients had temperature and the fetus was dead. In case of high rupture of the membranes, however, where only part of the liquor amnii was lost, or where the head was low in the pelvis and acted like a ball-valve and some of the waters were retained, there was less danger in delay.

The following officers were elected for the ensuing year: *President*, Dr. GEORGE G. WARD; *First Vice-President*, Dr. S. M. BRICKNER; *Second Vice-President*, Dr. J. O. POLAK; *Secretary*, Dr. HOWARD C. TAYLOR; *Treasurer*, Dr. HERMAN GRAD.

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## TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.

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(Continued.)

### THE TREATMENT OF ECLAMPSIA.

DR. GEORGE TUCKER HARRISON, Charlottesville, Virginia, said that whatever be the nature and origin of the toxic substance which evoked the phenomena characteristic of eclampsia, two facts stood out in a clear light. In the first place, the potency of the poison that produced the toxemia was made manifest by the degenerative changes in the kidneys, the anemic and hemorrhagic necroses in the liver, the hemorrhages into the brain, and multiple thrombosis. In the second place, as a rule, the evacuation of the contents of the uterus was attended by a speedy relief of the symptoms—*restitutio ad integrum*. Bearing these facts in mind, it was logical to maintain that in cases of acute toxemia in pregnancy, whether with or without eclamptic attacks, the indication of treatment was to empty the uterus as speedily as may be. The prophylactic treatment of Stroganoff, which consisted in placing the patient at absolute rest, in a room to herself, morphin in small doses hypodermically, chloral



hydrate per rectum, and a milk diet, had its advocates. In the speaker's hands the results were good only in mild cases.

He agreed with Fritsch when he asserted that it was surely unreasonable to continually add to an already poisoned organism, new poisons in excess. If the cervix was dilatable or dilated, either by manual dilatation or by the use of the metreuyster, but not by metallic dilators, sufficient dilatation might be obtained, so that version and delivery might be accomplished in a short time. Forceps should be applied only when the head was fixed in the pelvis. In the case of primiparæ, when the cervix was maintained in its entire length, the indication was the vaginal Cesarean section. Beckmann found that by employing this operation he reduced the mortality 40 per cent. in the mothers as compared with results obtained by the conservative method previously used. The low mortality of the new-born was very striking. In forty-three cases he lost no child among multiparæ, and only four in primiparæ. Such a low mortality in vaginal Cesarean section, was an argument not to be underestimated, as he remarked in favor of this operation. It was important not to waste time in prophylactic measures. Every hour increased the danger by adding to the destructive processes, and hence the sooner recourse was had to actual interference, the better it was for mother and child. The abdominal Cesarean section should be reserved for cases of contraction of the pelvis. Decapsulation of the kidneys was an operative procedure not indicated.

#### THE INDICATIONS FOR AND THE TYPE OF OPERATION TO SELECT IN THE TOXEMIA OF PREGNANCY.

DR. JOHN O. POLAK, Brooklyn, New York, stated that having determined upon the interruption of the pregnancy the question arose, by what method should we proceed? This was determined by certain factors: first, the period of pregnancy; second, the condition of the cervix; third, the general condition of the woman.

What he was about to say relative to surgical evacuation, presupposed that the operator was skilled in gynecological technic and had at hand the facilities of a modern and well-equipped operating room.

Evacuation in hyperemesis cases might be made with the curet after careful dilatation of the cervix, when the pregnancy was eight weeks or under. After this period, owing to the bulk of the placental mass, and the presence of an embryo of some size, the pregnancy was best terminated by anterior hysterotomy and removal of the ovum with the Ward placental forceps.

Experience had taught him that these toxic patients were more susceptible to infection. This possible complication could be minimized by the strict observance of an aseptic technic, complete evacuation of the uterus and the avoidance of trauma. It was usual in this class of patients to find a long, rigid, hyper-

plastic cervix, which was more apt to tear than to dilate and thus introduce the dangers from trauma. Time was another element which influenced the prognosis. Prolonged anesthesia was detrimental and not well borne. These difficulties were met by anterior hysterotomy and the employment of ether-oxygen vapor anesthesia for the narcosis. Chloroform should never be used in the presence of a pregnancy toxemia on account of the liver destruction which is apt to follow its employment.

The above statements also applied to the toxemias in primiparæ of mid-pregnancy. When, however, we were dealing with eclampsia in the last month or at term, in women other than primiparæ, less radical procedures should receive consideration. Vaginal Cesarean section was not well adapted to the delivery of the full-term child, especially in the presence of a small vagina and a rigid vulvovaginal orifice, unless sufficient room was gained by deep lateral incisions through the introitus.

An analysis of twenty-nine consecutive cases without maternal mortality from the service of the writer might elucidate some points of clinical significance. Twenty were pregnant for the first time. Of this number, eight were in the hyperemesis class, twelve were later toxemias or eclamptics. Of the remaining nine, all multiparæ, only one was suffering from pernicious vomiting, while eight had eclamptic seizures.

Of the early toxemias, but one woman presented symptoms so grave as to require evacuation before the tenth week. All were delivered before the end of the fourth month, every palliative method having been used before interruption was resorted to.

Among the twenty cases of the toxemia of the later months, from five and a half to term, there were three women whose cervices were unusually long and rigid, upon which repeated packing had made no impression. These women were about six months pregnant. Eight were in the preeclamptic state, with persistent blood-pressure of 180 to 220 mm. Convulsions had occurred in all of the remaining twelve. One had two seizures, another eleven, before delivery was attempted. Anterior vaginal hysterectomy was selected because it afforded the safest, quickest and surest method of securing sufficient dilatation for delivery. The average length of the operation, including the delivery, was twenty-three minutes, the shortest nineteen, the longest thirty-seven. No vesical injury was sustained. Lateral incision of the pelvic floor was required twice, owing to the small size of the vulvar outlet. None of the deliveries was complicated by pelvic contraction sufficient to interfere with bringing down the uterus. A longitudinal incision of the anterior vaginal wall was made, extending from the meatus to the cervix, not the "T-incision" recommended by Peterson. The anterior uterine incision alone was employed in all of the cases in this series, as he had found no great advantage from the anterior and posterior division of the cervix and lower uterine segment. The hemorrhage had been inconsiderable in

his cases, which he believed to be due to the free use of ergot immediately on the delivery of the fetus, the manual removal of the placenta and the firm tamponade with gauze, until the sutures had been placed in the upper angle of the incision. The convalescence had been smooth and without complication and primary union of the vaginal and uterine incision resulted. One other technical point was the use of interrupted sutures in both incisions, thus maintaining the length of the anterior wall, keeping the cervix pointing backward by straightening the canal, and securing better drainage. Two women had subsequently been delivered spontaneously of full-term children without complication, the cervix dilating naturally.

In the hyperemesis cases, the effect of evacuation by section had been most striking. The vomiting ceased almost from the moment the patient recovered from her light anesthesia. In this series of eclamptics, all the children were premature, fifteen were born alive, only two, however, were sufficiently viable to survive.

In summarizing he drew the following conclusions:

1. That toxic vomiting which resisted rest, lavage, dextrose enemata, enterocleisis, in which the urine showed a high ammonia ratio or a persistent acetonuria, the blood a total white cell count of under nine thousand, and the maternal pulse remained one hundred or more, should have the pregnancy interrupted.

2. Before the placental formation, the curet was the method of choice, and after this period anterior hysterotomy offered decided advantages.

3. The preeclamptic state, characterized by its high blood-pressure, diminished urinary output, persistent albuminuria, etc., not yielding to dietetic, eliminative and medicinal measures, justified evacuation, and that surgical methods in skilled hands did less injury and had a lower mortality and morbidity than the less radical procedures.

4. When convulsions and coma had occurred, the termination of pregnancy improved the chance of the patient's recovery, and that the method of delivery depended on the condition of the cervix, which determined whether it be by incision, bag or nature, supplemented by version or forceps.

Finally, that anterior hysterotomy should always be the choice over manual dilatation, where no effacement of the cervix had taken place.

#### TREATMENT OF ECLAMPSIA.

DR. CYRUS A. KIRKLEY, Asheville, pointed out that prophylaxis was the more satisfactory treatment in the toxemia of pregnancy. Indefinite treatment was due to obscure etiology. Renal and hepatic insufficiency were probably the main etiological factors. The symptomatology was briefly discussed and the speaker believed that the quantity of urea excreted rather



than the presence of albumin determined the proper course of treatment.

To eliminate accumulated toxins and to restore impaired or arrested function in the eliminative organs was the aim of treatment. Calomel and soda, followed by a saline, alkaline diuretics, if not contraindicated, the hot pack, the hot-air bath, glonoin, massage, pure air, and abundance of pure water were important aids in treatment. Venesection, if not contraindicated, both as a prophylactic and during and after the eclamptic seizure, was strongly endorsed. Chloroform and morphin were in disfavor. *Veratrum viride* was second only to venesection as an anti-eclamptic, but was in no sense a substitute. Decapsulation of the kidney had a doubtful place in the treatment of eclampsia, but thyroid extract might be useful as a prophylactic measure.

The uterus should be emptied as soon as it could be done without increasing the risk to the mother. Should labor not begin with the first seizure, and if the internal os uteri was obliterated, dilatation and delivery by forceps or podalic version might be accomplished.

The indications for Cesarean section were pointed out, but too radical as well as too conservative treatment might result disastrously. Convulsions did not always cease after the uterus was emptied, but the prognosis was certainly more promising. While Cesarean section should not be the dernier resort we should be absolutely sure that delivery by other means was impossible.

#### DISCUSSION.

DR. REUBEN PETERSON, Ann Arbor, Michigan, stated that as long as the prophylactic treatment could be carried on and the patient was improving, it was the duty of every obstetrician to carry it out. If the patient, however, failed to improve under the prophylactic treatment, then came the question of what to do, and he held with Dr. Polak and with Dr. Harrison that the best method was to empty the uterus and to do so as quickly as possible. If the cervix was dilated so that one could with a little more manual dilatation deliver the woman, this should be done. On the other hand, if the cervix was rigid, it was a good deal better rather to do a vaginal Cesarean section than spend considerable time in dilating the cervix. The trouble with vaginal Cesarean section and the statistics which he gave last year had been that the profession had not recognized the fact that all other methods of treatment under certain conditions should be done away with and we should immediately empty the uterus in the quickest possible time. His statistics last year showed conclusively that in this large number of cases, namely, 530, by all kinds of operators, with convulsions varying from one up to forty or fifty or more, the mortality from vaginal Cesarean section was very high. On the other hand, if one carefully read the statistics, he would see that quick evacuation of the uterus



immediately upon the first convulsion, or in the toxemia of pregnancy when it was decided to empty the uterus, was followed by very favorable results. The reason that there had been so much opposition to this method of terminating pregnancy, was because the statistics showed that the mortality was very high.

He would like to say a word in regard to abdominal Cesarean section in the termination of pregnancy. Since his paper last year, being interested in the subject, he had sent letters practically all over the world, and he had collected something like 421 cases where abdominal Cesarean section had been employed to empty the uterus in eclampsia. He was not ready to give his conclusions on this vast number of cases, because to him it was surprising that the operation had been performed so many times for this indication, but he could only say that as far as statistics were concerned, the operation of abdominal Cesarean section was not attended by as good results as one might suppose. It showed that after other attempts had been made to empty the uterus, abdominal Cesarean section was done, and the statistics were poor. On the other hand, when the convulsions were few and the operation was performed, the statistics were good. According to the last or most recent statistics of abdominal Cesarean section, the mortality was 50 per cent. or more. With the varying number of convulsions and the operation being done by operators at the country cross-roads and all over the country and the world, the maternal mortality in 421 cases was only 36.1 per cent. This was a high mortality, when it was compared with Stroganoff's of 5 or 6 per cent. But we must remember the conditions present in his cases, while others waited and waited, which meant a poorer chance for the patient.

In regard to the fetal mortality, this should be far less than with vaginal Cesarean section. The mortality of vaginal Cesarean section in 530 cases was 21.2 per cent.; the fetal mortality in 421 abdominal sections was 5.9 per cent., so that the last word had not been said in regard to the method of emptying the uterus in the presence of eclampsia. As an obstetrician he did not mean to say that when a woman had convulsions and she consulted him that the uterus should be emptied by abdominal Cesarean section. Not by any means, but we would have to consider this subject in the light of modern methods and reserve our judgment. When the time came, instead of employing other methods first, and vaginal or abdominal Cesarean section second, if operators would do the operation first, they would see a great improvement in the mortality.

DR. BARTON COOKE HIRST, Philadelphia, considered the suggestion offered by Dr. Ward very valuable, but he would like to ask him and the other members if they had considered the greater efficacy of parathyroid extract, which the Italian obstetricians had demonstrated to be of greater benefit in the toxemia of pregnancy than the secretion of the thyroid gland itself. Personally, he had used parathyroid extract for five or six years,

and he believed that in these types of toxemia he got better results than from the thyroid extract itself. The toxemias that required parathyroid treatment were rare however; they constituted only a small proportion of the cases of toxemia seen in practice. As to the paper of Dr. Davis, who had called attention to the treatment applicable to the cases seen by the specialist from the beginning, these were easily dealt with, and by the modern means advocated by Dr. Davis, success was assured, but the majority of cases were seen in consultation and in hospital practice. He did not find such severe cases of toxemia as those described, and he almost never saw a case of eclampsia in his own practice. The preventive treatment which he carried out made this disease one of the rarest in dealing with private patients. While Dr. Davis' treatment was good in the class of cases he was describing, it did not suffice in the majority of cases he had encountered. There would have to be more energetic means taken for elimination, especially in regard to sweating, than Dr. Davis had advocated, to get the best results.

He felt strongly opposed to Dr. Harrison's unqualified advocacy of the operative treatment, and he thought the Society ought to carefully consider its responsibilities to the general profession. In the United States there were approximately 7500 cases of eclampsia every year. Of that number, the vast majority were attended by the general physician, and if the doctrine went forth from the Society to the effect that the unqualified treatment of toxemia and eclampsia was the operative treatment, it would do a vast deal of harm.

DR. RICHARD C. NORRIS, Philadelphia, agreed with Dr. Hirst. He thought Dr. Polak had struck the keynote of the situation when he discussed the condition of the maternal soft parts and the critical condition in which the mother was found. He was quite sure that many men had not been persuaded that vaginal Cesarean section was the only operative method in treating these cases.

Yesterday, before coming to the meeting, he had his assistant look up the last thirty cases of toxemia at the Preston Retreat, in order that he might take part in this discussion. The last thirty cases occurred during the period when vaginal Cesarean section had been discussed by the profession. Of these cases there were thirteen actually eclamptic women who had forty-two convulsions; there were seventeen preeclamptic cases past the seventh month of pregnancy. This group of cases was treated by the conservative plan, cases that in his judgment did not require the aggressive operative methods, yet only one woman died without eclampsia, from a widespread accumulation of fluid in the serous cavities chronic Bright's disease, and none of the infants died, most of them being premature. He was sure, if he had subjected every one of these women to vaginal Cesarean section he would not have had better results. He believed the time had come for us to attempt to study individual cases and

properly classify them. There were unquestionably some cases of eclampsia so fulminating in character, so serious and accordingly dangerous, with the soft parts in such a condition, that men of experience could decide that these cases must be treated by vaginal Cesarean section, but it was utter folly to his mind to advocate that if a woman was eclamptic or there had been eclampsia, she should have the soft parts cut open and immediately extract the fetus without any attempt at other methods of elimination. To his mind this was the very height of surgical folly. Reasoning on such a basis, one might as well treat every septic case by removing the uterus. Time would clarify this subject. We must wait for the physiological chemist; we must have clinical methods at our disposal which will differentiate the types of cases. At the present time we could say only this, that in the hepatic types of toxemia in primiparous women, with rigid hyperplastic birth canals, we should seriously think of vaginal Cesarean section, and not use it as a routine, at least in the exceptional cases.

DR. J. WHITRIDGE WILLIAMS, Baltimore, was very much interested in what Dr. Polak had to say because what the latter said concerning the operative technic was better said than the speaker could describe it. When we had to empty the uterus for vomiting of pregnancy, vaginal hysterotomy or Cesarean section was the method, and he had employed this method for some years.

As to the method of emptying the uterus in cases of eclampsia, it was very essential to individualize, but he believed that in every case, where the cervix was rigid and where prompt delivery was necessary, vaginal Cesarean section was the operation of choice. He had employed this operation in a large number of cases with great success and great operative satisfaction.

DR. CHARLES M. GREENE, Boston, said the paper of Dr. Davis was one that appealed to a conservative man. It seemed to him that his results were better on that general line than by the more active operative measures. If we were going to be of the greatest service to womankind in this matter of pregnancy toxemia, steps must be taken to get at the cases early. He happened to have had considerable experience this winter as the result of a pregnancy clinic they had been running in Boston since a year ago last May, and the result had been a considerable diminution in the number of cases of actual eclampsia, that is, women who went on to the point of having fits. They got these patients in all periods during pregnancy, not only when they presented themselves at the clinic, but when found by the visiting nurse, who was sent to keep track of the women when they presented symptoms of toxemia of pregnancy. As the result of this work, they had had no cases of eclampsia. He did not mean to say by that none of them had to be delivered or had not been delivered, but they had found by putting these patients under the usual eliminative treatment, very often labor began and they



delivered themselves and recovered without having had any convulsions, so that he was firmly of the belief that we would get better results and have less actual eclampsia to treat, if we took steps in our clinics to get control of these women early.

DR. HENRY D. FRY, Washington, D. C., pointed out that just when the obstetrician ought to assist in treating these cases and trying to get them over the toxemia, and when he should empty the uterus, was a difficult point to decide, and he had hoped that when Dr. Williams brought out his ammonia coefficient idea, we would have some solid ground to stand on, but that did not work out in his practice. He had seen cases that would have died when the ammonia coefficient did not get above 6 per cent., and he had seen other cases get well when it was 40 per cent. and no operation was done. He was never satisfied to empty the uterus until he had tried one remedy which had served a good purpose in the treatment of the early stage of eclampsia. After putting the woman to bed and taking away all food by stomach and giving nutrient enemata, he used inhalation of oxygen, and if he could not stop pernicious vomiting, he was satisfied that he ought to empty the uterus.

The paper of Dr. Ward regarding the use of thyroid extract was interesting to him. He had made it a routine practice in the later months of pregnancy to examine the thyroid glands of all women, and if they did not have physiological enlargement of the thyroid at that time, if they had restlessness, sleeplessness, indigestion, he put them on thyroid extract, and had seen the symptoms disappear. He had seen the nitrogen output increase, and this did good in a certain class of cases.

A debatable question was whether or not we should empty the uterus in cases of eclampsia where there was a severe pre-eclamptic condition, or where the woman had had one convulsion. He was glad to hear Dr. Hirst say that the notion for immediate operation was getting so prevalent that doctors would come in and recommend emptying the uterus at once. If we could get an analysis of the 7000 cases of eclamptic women over the United States, we might be able to save a great many women's lives. We should not use as an argument against vaginal Cesarean section that men could not tell the difference between hysterical convulsions and eclamptic convulsions, or that they could not tell the difference between gut and placental tissue. This was no argument against vaginal Cesarean section. He believed that if we could not relieve the preeclamptic woman and felt we were getting into deep water, we should empty the uterus at once. If the woman had one convulsion, we should not wait for two. Liver lesions occurred from the absorption of toxins and we had no way of telling the degree of hepatic disease or trouble, nor how far the pathological conditions had advanced. If one were dealing with a multipara with a dilated cervix, no one would think of doing a vaginal Cesarean section in that kind of case, if forceps could be applied. No one advised vaginal Cesarean



section in every case of eclampsia, but it should be recommended to deliver the woman at once, whether by vaginal Cesarean section or otherwise. If the woman had a rigid cervix, and she was a primipara, he believed in doing vaginal Cesarean section every time, and not abdominal Cesarean section.

DR. GEORGE W. KOSMAK, New York City, (by invitation), said the term eclampsia was a misnomer in the class of cases to which we generally applied it. We had called a disease entity, the toxemia of pregnancy, by one of its prominent symptoms, but in a great many instances this prominent symptom did not appear. There were numerous cases of toxemia of pregnancy in the late months that did not have convulsions; some of them got over the toxemia, and some of them terminated fatally.

In the postpartum cases lesions were found exactly similar to those which were found in cases that went into convulsions before labor and during labor, and in certain cases where no convulsions occurred pathological lesions were found exactly similar to those of cases in which convulsions occurred.

At an A. M. A. meeting held in Atlantic City several years ago Dr. Welch of the New York Lying-In Hospital, showed specimens from a series of four cases. They included brains and livers from each of these women, two of whom had had convulsions and died as the result of toxemia, while the other two never had any convulsions, but passed into a fatal coma. Therefore, it was not fair in the treatment of these cases to assume that convulsions were the deciding factors, and this was why the speaker personally objected to basing a series of statistics on the presence of convulsions.

It had been stated that any woman who had had one convulsion should not be allowed to have another. What were we going to do with those women who did not have any convulsions? Many patients got well who had had seventeen or more convulsions, in whom no operative delivery was resorted to, but who were delivered spontaneously. If these women had had vaginal or abdominal Cesarean section done after the first convulsion, they would have been put in that column in which the operation was stated to have had a favorable outcome. This was not a fair basis upon which to draw conclusions in a disease which had so many manifestations as eclampsia.

DR. HUGO EHRENFEST, St. Louis, Missouri, referred to venesection in the treatment of eclampsia and pregnancy, and said it was an interesting fact that of late venesection had been suggested and recommended. Many of these cases, he thought, were spoiled by the introduction of saline solution. One never knew when saline solution might prove detrimental to the patient, but the withdrawal of a large amount of blood worked approximately the same way as forcing delivery. According to investigation, the true effect and force of saline solution lay in the loss of blood.

No matter what method of treatment was resorted to in these

cases, the patient should be put into a hospital, if possible, and all statistics based on the hospital experience in treating these cases. This should be one of the first points in any therapeutic effort. The majority of patients suffering from the toxemia of pregnancy could be brought into a hospital. He thought it was unsafe to resort to operative measures amid unfavorable surroundings. Conservatism should always be kept in mind in dealing with this class of patients.

#### PRESIDENT'S ADDRESS: THE HISTORY OF VESICOVAGINAL FISTULA.

DR. HOWARD A. KELLY, Baltimore, pointed out that the ancients confused all forms of inability to retain the urine under the common heading of "incontinence." T. G. Thomas had spoken of the plan of treatment by means of hooks which was recommended by Ambrose Paré, though Thomas failed to give the reference.

Felix Plater (1597) discussed the condition with the utmost clearness, but had no remedy ready to propose. The first great light upon the subject was found in the work of van Roonhuysen in 1663, describing a method of posture, exposure, denudation, and closure by means of a quill suture. Fatio in the same century carried out the van Roonhuysen suggestions successfully. The great light thus shed upon the subject was then lost and writers for the succeeding 150 years seemed to have known little about the work of van Roonhuysen. The subject was treated by Velthuis in 1724; the great French surgeons Petit and Desault in the last decade of the seventeenth century; by the great German surgeon, Naegle, in 1812 and by Schreger of Erlangen. Lallemand continued to work at it for a decade without success and Dieffenbach confessed his own failures as well as the lamentable failures of his predecessors and contemporaries. Light was shed upon the subject by the labors of Gosset in 1834, Hayward of Boston in 1839 and Mettauer of Virginia in 1848.

The speaker paid a tribute to the memory of Wuetzer, who worked so patiently and faithfully upon the subject with ever increasing success (1832 to 1843), adding that the work of the great French plastic surgeon Jobert de Lamballe and that of his pupil, G. Simon of Germany, would undoubtedly in time have brought this difficult field of surgery into the light of successful treatment, had not these two pioneers been eclipsed by the splendid labors of Marion Sims, Emmet and Bozeman of this country.

In appreciation of Sims' work, he stated, that every step had been used before with more or less success by a number of surgeons and that Sims did not invent any single step or procedure, but devised his successful operation and put it on a plane never before realized or anticipated, by utilizing various steps, each one of which had been previously employed. In this way Sims brought success out of failure in a manner which did far

more to demonstrate his genius than if he had made some entirely new discovery. He took the materials which lay already to hand, available for all men, and where others had failed, brought good fortune out of the womb of failure. His successes were due to his clear recognition and skillful use of those fundamental principles which have since become the basis of all successful plastic surgery. The speaker then declared his conviction that Sims and Emmet and Bozeman undoubtedly succeeded with a regularity and in a class of cases which no operator of to-day could hope to imitate. This was due to the enormous skill acquired through their patient persistence and experience with a vast number of cases.

The speaker then went on to discuss the newer dissection and flap-splitting methods of treatment other than those of direct denudation of the margins of the fistula, dwelling particularly upon the work of Hayward, Pancoast, Colles, Blasius, Mackenrodt, Walcher, and their followers.

(To be continued.)

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## TRANSACTIONS OF THE MEDICAL SOCIETY OF THE COUNTY OF NEW YORK.

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*Meeting of February 26, 1912.*

*The President, CHARLES GILMORE KERLEY, M. D., in the Chair.*

The scientific session was devoted to a symposium on perineorrhaphy with lantern slide demonstrations.

ETIOLOGY OF PERINEAL LACERATIONS: PRIMARY PERINEORRHAPHY: INDICATIONS AND TECHNIC.\*

DR. J. CLIFTON EDGAR read this paper.

SECONDARY PERINEORRHAPHY: IN PRINCIPLE AND IN PRACTICE.†

DR. ARNOLD STURMDORF read this paper.

THE TREATMENT OF PROLAPSUS OF THE UTERUS WITH ATTENDANT CYSTOCELE AND RECTOCELE.

DR. J. RIDDLE GOFFE presented this paper. He said that while all more or less familiar with these displacements they were the *betê noir* of the surgeon and the gynecologist not because they were not amenable to treatment but because the operations were not based upon correct dynamic principles. Hitherto the perineum or the floor of the pelvis had been considered the sole support of the pelvic organs but they now had

\* Paper to appear later.

† For original article, see page 382.



come to realize that the support of the pelvic organs conformed to nature's general plan of holding organs in place by suspension with ligaments from above. The bladder like the uterus was supported by ligaments under normal conditions. The function of the perineum thus became restricted to supporting the rectum and assisting in parturition and defecation by lifting the perineum over the head of the child in parturition, and over the fecal matter in defecation. During great efforts such as straining at stool or lifting great weights, the intra-abdominal pressure might bear the uterus and also the bladder down onto the floor of the pelvis where it might receive temporary support, being lifted back again by their normal attachments above the normal position thus restoring the pelvic equilibrium. A rectocele was formed in only incomplete tears of the perineum. The supporting and lifting influence of the levator ani was here destroyed and the rectocele became a pulling force constantly tending to drag the uterus down. It became the primary factor in the production of prolapsus or procidentia. In the operation which he had devised for the relief of procidentia with rectocele and cystocele, his design had been to shift some of the responsibility for success in these operations from the floor of the pelvis to the ligaments of the uterus and bladder. In the repair of the floor of the pelvis he had always laid stress upon the restoration of the levator ani muscle as the essential factor in restoring function to the floor of the pelvis and securing permanency of results. More recently he had been convinced that these objects would be best obtained by actual exposure and direct union of the two limbs of the levator muscle, stitching them together by buried sutures in front of the rectum, *i.e.*, between the rectum and vagina in accordance with the method described and practised by Dr. Sturmdorf. From the operative standpoint, cases of procidentia and cystocele might be divided into two classes, first those in women during the child-bearing period, and second patients at the time of menopause or beyond. In the first class the condition was as a rule not extreme and the uterus must be preserved. First the uterus was curetted and trachelorrhaphy or amputation of the cervix was performed. Then a transverse incision through the vaginal wall was made in front of the cervix and through this the bladder was dissected from the uterus up to the peritoneal reflection. The peritoneal cavity was then entered and the peritoneum at the line of reflection was torn across widely from side to side out to the broad ligaments. The bladder was then dissected from the vaginal wall by means of a dull dissector or the end of a blunt pointed scissors. The dissection should extend to the urethra and reaching out to the limits of the bladder on either side, the bladder being thus set free from all its inferior attachments. An incision was then made through the vaginal wall through the entire length from the middle of the transverse incision up to the urethra. With an anterior retractor the



bladder and the vaginal flaps were lifted up behind the symphysis and the fundus uteri turned down into the vagina. This brought the appendages into view and within reach where they could be treated surgically if necessary. The round ligaments were then shortened by doubling them on themselves and the loop made fast to the uterus at the anterior origin of the round ligaments. Three chromicized catgut ligatures, No. 2, were passed, one through the anterior wall of the uterus at its middle point and the other two through the anterior walls of the broad ligaments just outside the lateral margins of the uterus. These were left long and protruded through the vulva. A point was now selected in the base of the bladder at such a distance from the urethra that when carried up to the point of insertion of the first of these three ligatures it would cause the base of the bladder to make a straight line from the urethra to the uterus. Through this the suture was passed catching up in its course the bladder attachment of the peritoneum where it was torn from the uterus. Two points in the base of the bladder were now selected at either side of the first selected point and at a distance from it of an inch to an inch and a half. Through these points the lateral sutures were passed respectively. The three were then tied, beginning with the middle one. The first one took up all the slack in the line from the uterus to the urethra, but made a ridge in the interior of the bladder with a sulcus on either side. By tying the lateral sutures, however, these sulci were obliterated and the base of the bladder was spread out upon the anterior face of the uterus and broad ligaments. The overstretched fascia and wall of the anterior vagina was now cut away to such a degree on either side of the median line that when stitched together would make it fit snugly under the base of the bladder. This relieved the hernia and restored the support which the bladder received from the fascia lata on either side. The vagina was then stitched to the uterus at points that would smooth out the anterior vaginal wall but would not shorten it to a degree that would cause it to pull on the cervix. The transverse incision in the vagina was closed with a running suture. The floor of the pelvis was reconstructed in accordance with the method described by Dr. Sturmdorf. The vagina was loosely packed with gauze and the operation thus completed. The cases of the second class were found in elderly women who had borne many children. These were the severest and most unmanageable cases. The principles of the operation were the same as in the minor cases, but their application was slightly different. As the tissues in the pelvis in these cases were atrophic, thin and friable, they were useless as supports and he had made it his rule to remove the uterus by vaginal hysterectomy. To provide a support for the bladder and also a surface to act as a deflector of intra-abdominal pressure, he stitched together the broad ligaments from the round ligaments down to their bases taking in sufficient slack to make them draw taut across the pelvis. Upon this plane he

proceeded to spread out and make fast the base of the bladder following the same technic as in the previous cases. The anterior wall of the vagina was cut away as before, its edges stitched together and the upper end fastened to the broad ligaments. He had also inaugurated the plan of plicating the rectum on itself by inserting a line of buried sutures across the anterior wall, passing the stitches parallel to the longitudinal axis of the rectum. In some instances he had passed two or three lines of such sutures going up to the peritoneal covering. This necessitated extensive denudation of the rectum. The floor of the pelvis was then restored and colporrhaphy done through the entire length of the posterior vaginal wall.

Dr. Goffe said he had been doing these operations for the past nine years and in no instance had the uterus or bladder failed to remain in satisfactory position. In not one case had there been any infection to mar permanent healing of the tissues. In a few of his earlier cases there had been oozing between the anterior vaginal wall and the base of the bladder and it was now his custom to insert a small gauze drain between the bladder and the vaginal wall. The bladder gave little annoyance during the early stages of convalescence. This operation came into competition more especially with the operation of interposition of the uterus between the bladder and the vaginal wall. The latter operation seemed to serve very well in the early stages of prolapsus in which the cervix has not yet protruded at the vulva. The only objection thus far offered to the operation which he had described was that it was difficult and complicated. This was true but the skilled gynecologist should consider nothing too difficult which promised such assured results as this operation did.

#### DISCUSSION.

DR. GEORGE L. BRODHEAD said he agreed with Dr. Edgar, that one of the most frequent causes of laceration of the perineum, was the too rapid advance of the head and it was naturally a matter of judgment and experience to tell when the advance should be checked. As a rule, when the perineum was about to tear it became white, or the fourchette became dry and apparently brittle.

Dr. Brodhead was very glad that Dr. Edgar had called attention to the very important fact, that the exaggerated lithotomy position was a very frequent cause of lacerations of the perineum; there could be no doubt about this at all.

When it came to the question of prophylaxis, he thought that in operative work the feet of the patient should be supported by stirrups rather than by the usual leg holders; the soft parts and the tissues at the outlet were then not so much on the stretch and were less liable to tear. These stirrups can be easily carried in one's outfit. When the head is beginning to distend the outlet a small table should be placed at the foot of the operating table, so that the patient's legs could be taken from the stirrups and

allowed to rest upon the table. In this way the soft parts are relaxed, and a place is provided upon which the child can be laid.

Episiotomy is also a very important factor in prophylaxis. Dr. Brodhead had first seen the operation performed by Dr. Flint, and he had become so convinced of the value of the procedure that he had made use of it many times since. He had never seen a complete laceration of the perineum in vertex cases, and attributed the fact to the performance of episiotomy. The complete tears which he had had, were all in breech cases. Recently he had the care of a small woman with a big baby and when the baby was born he found a complete laceration of the perineum which extended  $1\frac{1}{2}$  inch into the rectum. In this as in other cases of breech presentations he felt convinced that if he had performed episiotomy he would not have had such severe lacerations.

The immediate repair of the perineum should not be adopted in these cases in all instances. Patients are sometimes exhausted by a long labor, perhaps have lost much blood, and in many cases there is insufficient light and poor, perhaps no assistance. Better results would often be obtained, if the operation were deferred until the day following when proper preparation could be made for a successful operation.

DR. BROOKS H. WELLS had no criticism to make of Dr. Edgar's paper and wished especially to commend his statement that delivery in the lithotomy position predisposed to perineal laceration. In secondary repair of the perineum the methods used today had been evolved from the work of the older operators. The suture of the levators had been suggested by Hadra in 1884 and by many since. Dr. Wells had always taught at the Polyclinic the necessity for approximating the levator edges and of restoring the central attachments of the transverse perineal muscles and had obtained clinically and anatomically very satisfactory results in the restoration of the lifting function without drawing the levators from their sheaths. During the last four years he had definitely exposed and sewed the levator edges. Haynes had published an interesting paper on this subject in the AMER. JOUR. OBST. in the latter part of 1908.

DR. GEORGE GRAY WARD had listened with great pleasure to the beautiful description by Dr. Sturmdorf of the operation he performed for repair of lacerated perineum. This work he heartily endorsed and one that he had carried on for years. His method was based upon the same principles and the results obtained were about the same. In the repair he used the perineal fascia as an aid. This in a way was comparable to the sphincter action of the masseter muscle in closing the mouth.

DR. LE ROY BROWN could not agree entirely with what Dr. Sturmdorf had stated in regard to his operation for the repair of lacerated perinei because he did not believe that he went far enough with his sutures in his attempt to repair the damaged parts and especially what was done to the posterior wall of the



vagina. He asked that they should refer to the anatomy of these parts and the anatomy he reviewed. It was about thirty years ago that Dr. Emmett read a paper before the American Gynecological Society in which he brought out the fact that in operating they did not attend to the separated fibers of the levator ani muscle on both sides and, afterward, perineal tears recurred as a rule. It was due to Dr. Emmett's genius that they were told to go up and take up the torn ends of this muscle with the fascia and bring them back and fasten them as they were originally. That operation has stood until the present day. One should be concerned not only with the levator ani muscle, but with the fascia which overlay it. Dr. Broun did not believe Dr. Sturmdorf went far enough on each side in picking up the torn muscle; therefore, his operation could not be entirely satisfactory. Dr. Emmett's operation should not be discarded.

DR. JOHN VAN DOREN YOUNG said that it seemed to him that the papers of the evening together with the discussion which had followed, illustrated the fact that the subject was one in which a large number of general practitioners and specialists were interested, and that an evening devoted to this important subject could not fail to bring benefit to both classes of workers.

It seemed to him that the most difficult problem before those who had listened to the papers and the discussion, was the comprehension of the picture complex, in other words: the understanding of the surgical conditions which were to be relieved. The solution of this problem was to be found in the anatomy of the parts as found in the dissecting room together with the changes in the so-called normal anatomy which occurred through injury at childbirth, and still further, the changes which occurred in the tissues which had been injured due to atrophy and change of position. In other words, no adequate understanding of this condition to be relieved could be had from the injury of the normal anatomy of the parts, but must be based upon the anatomy as distorted by the injury, and again as changed by atrophy following years after injury.

Dr. Young agreed with Dr. Dickinson, who had made a statement at a recent meeting of the New York Obstetrical Society, that it was far more difficult to obtain good results in the repair of lacerations of the perineal floor than in general abdominal surgery. In the repair of any injuries to the pelvic outlet, it was Dr. Young's opinion that the subject should be divided into the repair of the levator ani, the repair of the laceration of the perineum, and with the support of the hernia of the rectum and the consequent return of the rectum to its normal location; the repair of the urovesical trigone, and the replacement of the uterus to its normal position by some operation upon the uterine ligaments. Any operation looking toward the cure of the conditions found dependent upon or subsequent to perineal lacerations would certainly fail unless *all* these conditions were taken into consideration. For the support of the uterus it was his



opinion that none of the ligaments of the uterus played the important part that the uterosacrals did, as Dr. Goffe had called attention to in his paper, the uterosacral ligaments are the only ones that actually hang the uterus from the bony structure situated in the standing position above the organ to be suspended. The importance of these ligaments had, in his opinion, only recently been realized by operators. He referred to the work of Dr. Polak of Brooklyn, who had been using the uterosacral ligaments to support the stump of the uterus in supravaginal hysteromyomectomies. Dr. Young reported the case of a young woman with an intact hymen with the cervix at the vulva orifice; the patient was not one of general enteroptosis, but on the contrary was in particularly good health with the exception of the almost complete prolapse. He stated that he had seen altogether four cases where there was no injury to the pelvic floor; these cases demonstrated that stretched uterosacral ligaments alone, allowing an antrocession of the lower segment of the uterus and a subsequent prolapse of the entire organ, which prolapse being dependent upon the relaxed and stretched uterosacral ligaments irrespective of levator ani or perineal support, demonstrated the important part played by these ligaments in support of the uterine body.

Dr. Young was interested in what Dr. Edgar had stated in regard to lacerations of the perineum which occurred without injury to the mucous membrane or skin, and asked that Dr. Edgar express his opinion as to the best method of procedure in these cases.

In speaking of Dr. Goffe's paper Dr. Young felt that the gratitude of every operator was due Dr. Goffe for an operation which gave relief from a condition which had been the cause of such suffering to patients and which all other surgical procedures had failed to relieve. He asked Dr. Goffe as to the possible danger of injury to the ureters at the time of operation and subsequent effect of the operation upon them.

Dr. Young asked Dr. Sturmdorf if ligatures which encircled as much muscle structure as those illustrated in his pictures were tight enough to hold the structure in place would not be followed by atrophy of the muscle fibres encircled by the ligatures, and as to whether the suture of the sheaths of these muscles would not give the same result without this danger?

DR. AUSTIN FLINT, JR., in discussing Dr. Edgar's paper, said that it had been his habit when the head was about to be born to bring the knees together and he believed, by so doing, the lacerations of the perineum occurred less frequently. The lacerations that occurred were due in large part to a distention of the perineum downward, and this could be lessened by such a procedure. Pushing the perineum back would save many of them.

With regard to episiotomy it was very necessary to know just when to perform this operation. Unquestionably, in his hands, it had saved a great many complete tears.

He had done the operation described by Dr. Sturmdorf many times, but with certain modifications. The modifications consisted in adhering to the original principles of the Emmet operation, working at the upper edges of the levator ani muscle, bringing them together and securing them in place. The result was a perineum very much like the one Dr. Sturmdorf described and one that afforded him the best results.

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## TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

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*Meeting of April 18, 1912.*

*The President, Dr. W. M. POLK, M. D., in the Chair.*

This meeting was held under the auspices of the Section on Obstetrics and Gynecology.

DR. C. C. SICHEL, M. D., reported several cases:

### CASE I. FIBROMYOMA OF THE OVARY, COMPLICATED BY ABDOMINAL ASCITES, SUBACUTE APPENDICITIS AND GALLSTONES.

Mrs. G., a native of Italy, aged fifty-five, had had seven children. Menopause had occurred at fifty-two years of age. The patient had had pain in the sacral region for two years; frequent micturition; bowels normal; pain in the abdomen; and gradual increase in the size of the abdomen.

On admission the abdomen was found markedly distended and tender; circumference 43 inches, painful, and under considerable tension. A paracentesis was done and one and one-fourth gallons of brownish serum removed. A large mass in the lower belly was then palpable, moving with bimanual examination of the uterus. A laparotomy was done and dense adhesions between intestines and tumor were found and separated; a large quantity of fluid evacuated from the abdominal cavity, and a large pedunculated tumor of the right broad ligament removed. No ovarian tissue could be found in the right broad ligament; the left ovary was intact. Chronic catarrhal appendicitis was found and the appendix removed. The gall-bladder was palpated, demonstrating the presence of stones. Abdominal wound closed after incising above the gall-bladder; 216 stones were removed. Patient made a normal recovery. The tumor on pathological examination was found to be fibromyoma of the ovary.

### CASE II. RIGHT PYOSALPINX, LEFT TUBOOVARIAN ABSCESS, COMPLICATED BY EMBOLISM OF THE FEMORAL ARTERY.

Mrs. E., aged forty-four years, United States of America. On

admission complained of extreme pain and tenderness in the right iliac fossa and abdominal rigidity. Bimanual examination demonstrated a mass on both sides of the uterus. A pyosalpinx and enlarged plexus of veins on the right side were removed; a tuboovarian abscess of left side was removed.

Four days after the operation, the patient complained of pain in the right foot and loss of feeling. The pain extended up into the leg and increased in severity in spite of all local measures.

A diagnosis of an embolism, probably involving the popliteal artery was made. On cutting down on the popliteal, no blood was passing through the same. The popliteal artery was opened, and a probe introduced some 12 or 14 inches before the clot was dislodged. The circulation returned, the popliteal was sutured, and the circulation reestablished, keeping the same under observation before closing the wound.

Within a few hours, however, the clot formed again at its original site in femoral artery. We again cut down on the popliteal as gangrene had set in; again inserting the probe, we dislodged a clot of blood some one and one-half inches in length. There was no sign of any clot at the seat of the popliteal suture. In sewing the popliteal at the first operation, the sutures did not go through the intima. After reestablishing the circulation, amputation was done at the knee and the popliteal artery tied off.

The patient made a perfect recovery, there being no further evidence of the renewal of the femoral clot.

CASE III. POSTPARTUM SEPSIS COMPLICATED BY RUPTURE OF AN OLD PUS TUBE INTO THE MESENTERY, RUPTURE THROUGH THE MESENTERY, INTO THE ABDOMINAL CAVITY, DIFFUSE PERITONITIS, DEATH.

Mrs. C., aged thirty-five years, United States of America. Previous history of the patient showed that she had been confined ten days before admission to the hospital. On admission: temperature  $104.4^{\circ}$  F., pulse 120, respiration 44. Blood examination: red cells, 1,140,000; hemoglobin, 45 per cent.; leukocytes, 5,200; differential polynuclears, 71 per cent.

The patient died five days after admission, her temperature going as high as  $106^{\circ}$  F.

The postmortem showed an old pus tube on the left side, probably of some years' standing. The tube had become attached to the mesentery and had ruptured into it, distending the layers of the same until the pus broke through producing a diffuse peritonitis and death.

I report this case as another example of the fact that old pus tubes can be, and are frequently, restarted on an acute course, not infrequently rupture into the peritoneal cavity with a fatal result. I have a record now of over a dozen cases of a similar nature.



CASE IV. CASE OF INDUCED ABORTION, PYOCYAMOUS BLOOD CULTURE, ANTISTREPTOCOCCIC SERUM USED WITHOUT SUCCESS.

Mrs. P., aged thirty-six years, United States America. The previous history showed that she had had two children, and four induced abortions in the last four years.

The patient, being three months pregnant, had an abortion induced by a midwife, bougie being introduced into the uterus. Abortion occurred in two days. Two days after abortion, as patient had a chill, she was cureted by the midwife. Two days after curetage, the patient, becoming alarmed, called in a physician who treated the case for five or six days as one of typhoid pneumonia.

On admission the patient was found to have a mucopurulent discharge from the vagina, but no abdominal tenderness or rigidity. There was a presystolic murmur at the apex of the heart. The uterus was swabbed out, and iodine gauze packing was inserted, and allowed to remain for twenty minutes. This was repeated on the following day. Four days after admission, patient developed a right sided hemoplegia, involving also the right side of the face. She ran the usual septic course and did not respond to treatment, the temperature varying from  $101^{\circ}$  and  $105.8^{\circ}$  F., the pulse from 110 to 150. She had numerous chills.

The patient died two weeks after admission.

Aphasia was present, with the paralysis.

Laparotomy was performed, and the right broad ligament which contained an enlarged plexus of veins was removed, the uterus and adnexa being walled off by a gauze drain. At the time of operation, the uterus was small and contracted. There were no signs of any local peritonitis; the tubes and ovaries were apparently normal.

One hundred and fifty cubic centimeters of antistreptococcic serum were given subcutaneously without any apparent reaction.

In justice to this form of treatment, however, I wish to state that the serum was not used until after the patient had been ill for some days. The blood culture showed pyocymous infection and a few colon bacilli.

*Autopsy Findings.*—Abortion in third month, mitral valve of the heart showed recent soft yellowish thrombi; bacterial endocarditis within infarctions of the kidney and spleen; chronic interstitial nephritis, parenchymatous degeneration of the liver with a probable cerebral embolism to be determined after hardening of the brain.

CASE V. PREGNANCY, COMPLICATED BY A FIBROID OF THE ANTERIOR WALL OF THE UTERUS WITH VARICOSITIES OF THE BROAD LIGAMENT; LAPAROTOMY; INSPECTION OF A NORMAL APPENDIX; GANNOUS APPENDICITIS DEVELOPING WITHIN FOUR DAYS AFTER OPERATION. SECONDARY OPERATION; RECOVERY.

Mrs. R., aged twenty-eight years, United States of America.



The previous history of the patient showed that about one year previous to the patient's admission to the Washington Heights Hospital, she had a normal labor. The child died within two hours of its birth with a hemorrhage from the lungs. While carrying child, the patient complained of some pain in the left side. Five days after confinement, she developed pain and swelling in the left leg, followed on the twelfth by swelling in the right leg but no temperature. By position and heat, this swelling diminished, but no return of the patient to an upright position, it returned. There were also one or two attacks of moderate syncope. The edema of the legs continued for some time, but gradually improved. There was considerable pain at times in both broad ligaments. The patient's condition improved slightly, but any exertion brought on the pain and edema. She was warned against becoming pregnant again, a diagnosis having been made of marked varicosities in both broad ligaments, with a probable ovarian cyst on the right side.

The patient, however, returned to me in September, again pregnant. All the symptoms had returned in a very much severer form. She agreed to laparotomy.

A pedunculated fibroid was removed from the anterior wall of the uterus, as well as a tremendously distended plexus of veins and ovarian cysts on the right side; the left broad ligament, containing also a number of large veins, was left intact, the tube and ovary being in good condition. The uterus was emptied.

I inspected the appendix at the time of operation, but in no way handled this organ. The patient was troubled with a marked amount of postoperative distention. Patient's temperature after operation rose to 101.6° F. but dropped to normal. The distention increased. The wound was dressed and healed by primary tension. About the fourth day there was a sudden gush of fluid, clear serum from the lower end of the wound, which had collected in the abdominal cavity. About the fifth or sixth day the patient's condition suddenly became serious, pulse went to 138 and temperature to 103.2° F. There was pain and rigidity of McBurney's point, the leukocytes going from normal to 22, 200 differential polynuclear from 71 per cent. to 83 per cent.

The abdominal wound was rapidly opened, a gangrenous appendix removed, and the belly drained. The patient made a stormy convalescence, complicated by a secondary anemia, and is to-day in splendid health. The swelling of the right leg has entirely disappeared, the veins in the right broad ligament having been removed. On the left side where this was not done, there is at times a moderate amount of edema but this has been gradually improving. Strange to say, in spite of the adhesion existing on the right side, the patient has developed a small inguinal hernia which is easily reducible.

I report this case as being one with unusual complications and clearly demonstrating how rapidly an appendicitis may take

place and also calling attention to the bearing that a large varicosity in the broad ligaments has upon the return venous circulation of the lower limbs.

DR. BANDLER reported several cases

#### CASE I. THE EARLIEST RECORDED CASE OF ECTOPIC GESTATION.

The specimen represents one of the earliest cases, if not the earliest case, of tubal gestation recorded anywhere in the literature. The impregnated ovum is probably ten days old, is embedded in the tubal mucosa, has an envelope of trophoblast cells, contains a beginning embryo. There is as yet absolutely no suggestion of chorionic villi.

The patient had been married two months, and complained for a few days after her last menstruation of cramp-like pains in the left side, of a very severe nature.

Examination showed a mass the size of a walnut on that side. Examination of the uterus showed it to be some what enlarged with no evidence of inflammation or of any intrauterine pregnancy.

The patient was operated abdominally and a hemorrhagic ovary was found with the tube apparently normal and showing at no point any dilatation or distention of any mass or nodule suggesting an ovum. The ovary suggested the possibility of an ovarian pregnancy and was removed together with the greater area of the tube. After removing the tube, palpation gave the sensation or feel as if contained within the lumen were a very tiny kernel. The tube was hardened and cut in series sections and the above mentioned discovery was then made. Drs. Rubin and Moschowitz carried out the microscopic examination as well as the laboratory preparation of the specimen.

#### CASE II. ENDOSALPINGITIS TUBERCULOSA.

This occurred in an Italian woman twenty-six years of age; married five years; no children; no miscarriage. Shortly after marriage the patient began to complain of pain in the left lower abdomen, frontal headaches and backache, and a gradual loss of strength.

Examination showed a small uterus and a soft, slightly movable, tender mass to the right of the uterus with the left adnexa not clearly palpable. The mass was diagnosed as tubo-ovarian, probably cystic.

At operation the right adnexa were found to be converted into a thin-walled cyst about the size of a small orange, adherent to the lateral pelvic wall. Associated with it were several smaller daughter cysts. The left tube was somewhat distended at its distal end and closed. There was a small hard nodule about one inch from the uterus the size of a hazel-nut, there were soft small nodules along the course of the tube. Both tubes were removed. At the time of operation the condition was recognized as the one

known by the term Salpingitis Isthmica Nodosa, and its tubercular nature was anticipated. This was the case, too, in spite of the fact that there was no fluid in the abdominal cavity, and no trace of tubercles upon the uterus or adnexa or upon any part of the peritoneum.

Microscopic examination showed the typical picture of an endosalpingitis tuberculosa. The case was of interest mainly for the reason that only microscopic examination proved the character of the lesion.

### CASE III. THREE CASES OF ECTOPIC GESTATION REMOVED BY THE VAGINAL ROUTE.

The first case was of great interest for the reason that the patient had been operated upon by Dr. Bandler seven months previously for an ectopic gestation on the right side. The symptoms then were typical. There was no doubt of the diagnosis and the abdominal route was selected. The right adnexa were removed. At this operation examination of the left adnexa showed the Fallopian tube to be thickened and well infiltrated by a chronic salpingitis, but the outer or abdominal end was not yet closed. It was just the sort of a tube which lends itself readily as a nest for an ectopic gestation. For that reason the husband was warned of this possibility and was told to take precautions for at least two years so that conception might be avoided. Seven months after this operation the patient missed a menstrual period by several days and then began to stain, with attacks of cramp-like pain in the left side.

Examination showed a rather indefinite mass on that side and a diagnosis of ectopic gestation was made. In order to make sure that this diagnosis was correct an anterior vaginal celiotomy was carried out. As soon as the vesicouterine fold of peritoneum was reached, a distinct bluish discoloration was noted, showing that free blood or bloody clots were present in the peritoneal cavity. The peritoneal fold was incised, the uterus was drawn into the vagina, and an ectopic gestation was found in the left tube. It was readily delivered into the vagina and was removed without difficulty. The patient made a very smooth convalescence.

The other two cases reported had both been previously diagnosed as incomplete abortions before coming under Dr. Bandler's observation. In one the uterus was retroflexed and held rather firmly in that position by an adherent fixed tube. A differential diagnosis between a chronic salpingitis with adhesions and an ectopic gestation was by no means to be definitely made and for this reason an anterior vaginal celiotomy was done.

In the other case the uterus was enlarged, there was colostrum in the breasts; only an indefinite mass could be made out on one side and here again, though ectopic gestation was suspected, a differential diagnosis from incomplete abortion could not be positively made.



In both of these instances as soon as the vesicouterine fold of peritoneum was reached by the inverted T-shaped incision the typical bluish discoloration which denotes blood in the peritoneal cavity was observed. On incising the peritoneum the uterus in either case was delivered into the vagina, and ectopic gestation was found. The affected tube was brought into view, blood clots were removed and the tubes were excised without any difficulty.

In the preceding six months Dr. Bandler had operated on thirteen cases of ectopic gestation and in five of these had done an anterior vaginal celiotomy for diagnostic reasons. In the above three cases the removal of the tube appearing to be readily possible without any obstacles, the procedure was carried out.

Dr. Bandler prefers the anterior vaginal section to the posterior for purposes of diagnosis, for the simple reason that by it one sees the vesicouterine fold of the peritoneum and can often make the diagnosis of ectopic gestation by getting up to the peritoneal reflection without incising it. If the fold of peritoneum be incised the pelvic peritoneal cavity may be readily examined, the uterus may be brought into the vagina, the tubes may be palpated and brought into view and thus the procedure renders diagnosis by vision so definite that error can seldom occur. Furthermore, if it appear after such a procedure that the tube lends itself readily to removal, the operation is completed through the very incision through which the diagnosis was verified or was made. If by any chance removal of the tube appears to be too difficult, or if there is very much free blood in the peritoneal cavity, or if active bleeding is going on, the vaginal incision is closed and the operation is completed through the abdominal route. This vaginal colpopeliotomy, done for diagnostic purposes, takes at most four minutes.

*Special Meeting, April 25, 1912.*

FRANKLIN A. DORMAN, M. D., *in the Chair.*

This meeting was held under the auspices of the Section on Obstetrics and Gynecology. The Section was addressed by invitation, by Prof. J. Whitridge Williams, of Johns Hopkins University, Baltimore, Md.

WHAT CAN BE DONE TO IMPROVE THE TEACHING OF OBSTETRICS  
IN THIS COUNTRY?

DR. WILLIAMS said that some of those present might have noticed in the *Journal of the American Medical Association*, for January 6, 1912, a paper entitled "Medical Education and the Midwife Problem in the United States"; a paper which he read in abstract before the American Association for the Study and Prevention of Infant Mortality, Chicago, November 17, 1911. In



order to get information on this subject, he sent a questionnaire, containing some fifty questions concerning obstetric educations and the midwife problem, to the professors of obstetrics throughout the country. Forty-three replies were received, representing one-half of the acceptable and one-fifth of the nonacceptable medical schools, which indicated a most deplorable condition of affairs. Thirty-one replies came from the sixty-one schools which are designated as "acceptable" by the Council on Medical Education of the American Medical Association, as compared with eleven from the fifty-nine nonacceptable schools, not including one from Canada. This most deplorable condition of affairs was indicated briefly as follows:

1. Generally speaking the medical schools are inadequately equipped for teaching obstetrics properly, only one having an ideal clinic.

2. Many of the professors are poorly prepared for their duties and have little conception of the obligations of a professorship. Some admit that they are not competent to perform the major obstetric operations, and consequently can be expected to do little more than trained men-midwives.

3. Many of them admit that their students are not prepared to practise obstetrics on graduation, nor do they learn to do so later.

4. One-half of the answers state that ordinary practitioners lose proportionately as many women from puerperal infection as do midwives, and over three-quarters, that more deaths occur each year from operations improperly performed by practitioners than from infection in the hands of midwives.

5. Reform is urgently needed, and can be accomplished more speedily by radical improvement in medical education than by attempting the almost impossible task of improving midwives.

The above were part of the conclusions drawn in his paper, and he holds that no one familiar with doctors and medical schools, and with what is going on in this country can doubt the accuracy of such conclusions. It is generally admitted that much difficulty is experienced in teaching obstetrics in the medical schools. He did not come to criticize the conditions existing in New York, because he knew that the two greatest lying-in hospitals in the country are here. On this account the conditions are better in New York than elsewhere, but they are by no means ideal as far as instruction and ideals are concerned. No one can deny that conditions in general are in great need of improvement, and the conscientious teacher must accustom himself to them. Many doctors say: "I cannot see how you can be interested in obstetrics." In the ordinary medical school the Professor of Obstetrics was usually looked down upon, while greater respect is shown the Professor of Gynecology. A statement made to Professor Williams by one of the most eminent professors in the country was: "There is no likelihood of getting good men to go into obstetrics."

On the other hand take the medical student. He does not regard obstetrics very highly, and it is hard to get first rate graduates to go into obstetrics, which they desert for gynecology and surgery as soon as opportunity offers. He thought that if one compared the respect in which obstetrics and gynecology are held in this country with the conditions existing in Germany, the contrast would not be at all favorable to us. Furthermore, if one attended a meeting of the American Gynecological Society, and then one of the German Gynecological Society, he could not leave the latter without feeling ashamed of our institutions. In Germany many things are discussed which are decidedly of a scientific nature and of fundamental importance, while here only technical and practical details are of interest.

One reason students do not regard the science of obstetrics more highly is because they do not realize its importance and are not taught to look at it as a broad and wide branch of scientific knowledge. Professor Williams does not think, however, that the students should be blamed for this condition of affairs. The ordinary student in the medical schools has an interest in obstetrics, but so soon as he goes out and meets other men, his enthusiasm wanes and he soon begins to regard obstetrics as the least important branch of medicine. This lack of respect for obstetrics by the students is in great part due to the attitude of the professors themselves. When one sees the Professor of Obstetrics showing no interest except in the purely practical and technical aspect of the subject, one could scarcely expect the student to be impressed by him; and again when one looked at it from the financial side one would find that obstetrics was the poorest paid of all the branches in medicine.

On the other hand, part of the trouble is due to the fact that many schools have no facilities for teaching obstetrics; as a considerable number of schools have no lying-in hospitals connected with them, and while there are many insufficiently supplied with material. In many of the schools, less than one hundred women are delivered in one year, and these have to serve for the instruction of from seventy-five to one hundred students. Many of the professors, take up the teaching of obstetrics, not because they are specially interested in the subject or because they were specially equipped to do so, but merely because it may serve as a stepping stone to a teaching position in gynecology. After this is obtained, he drops obstetrics and thinks it a good riddance.

This then is the condition of affairs: poorly equipped hospitals; poorly equipped professors; and poorly stimulated students.

With regard to the remedy, one must face a radical departure; for if obstetrics is to be well taught, there should be a reorganization of the medical schools and of the lying-in hospitals and an even more drastic change in the character of the men holding professorial positions.

Professor Williams then considered the remedies under the headings of hospitals, medical schools and professors.

1. Hospitals. Outside of New York City he did not know of a single large, well-equipped lying-in hospital in the United States. One year ago he looked up the conditions existing in the German universities and he found that even in the smallest of them there was always a well-equipped women's clinic with abundant material and suitable teaching facilities. What is needed in this country are first rate lying-in hospitals, adequately housed, well-equipped and with abundant facilities for teaching scientific obstetrics. The ideal condition should approach a well-organized German Frauenklinik. In such hospitals there should be facilities for teaching both obstetrics and gynecology. They should be able to take a woman and treat her for everything connected with the genital tract, whether normal or pathological. He did not believe that even the combination of obstetrics and gynecology would solve the problem. It would rather make things worse, unless the Professor was paid sufficiently to give practically his entire time to the care of hospital patients, teaching and research. If, however, he attempted to carry on an extensive private practice at the same time, the only result would be failure. He believed that medical colleges with seventy or eighty students in a class should have a woman's clinic with seventy-five or one hundred beds. In such a hospital there was not only the practical side of taking care of these women in labor and performing various operations, but also the training of assistants and advancing knowledge. In most lying-in hospitals the assistants remain six months or a year and go away with a smattering knowledge and think they know something. He had had much experience with assistants; most of them who were just beginning to be useful at the end of one year, but they were really not well trained until the end of the third or fourth year. In proper women's clinics a longer term of service would be necessary, and should cover five, or even six years.

Of course the number of cases the student saw was very important; with few exceptions in this country the schools do not offer sufficient material in this regard. This is one of the problems that must be faced. Again these cases should be followed before and after labor, and the students should also be taught the rudiments of gynecology and the ordinary diseases of women, and their connection with child bearing.

2. Medical Schools. Last year there were one hundred and twenty medical schools in the United States, while there were but twenty-one in Germany. There was a great desirability of getting rid of many of these schools. The faculty should be chosen from those who were thoroughly first rate, well-equipped, scientific men. When any university went into the teaching of clinical medicine it was a very expensive experiment; as it costs far more to run a well-equipped clinical department than any



other department in the university. They were slowly facing this subject; and some of the larger universities were beginning to recognize their obligations to medicine. It was easy enough to run a laboratory of pathology, of physiology, and so forth, without very great expense; but to run a well-equipped clinical institute in a single branch of practical medicine called for an immense expenditure of money.

3. Professors. There is quite as great a need for radical change in the professors as in the hospitals and universities: the ordinary professor in the clinical branches of medicine in this country did not take his professorial duties very strongly to heart; he gave a few hours each week to teaching; he might look after and supervise the care of the institution he was connected with; but he had no idea of devoting most of his time to teaching students, properly training his assistants, and advancing knowledge. Such reforms were bound to come, and they would gradually develop a body of men who were not going into medicine primarily for practice, but because it offered them a scientific career. If such men could be developed, and be prevented from practising outside of the hospital (they might limit their practice to consultations only) it would result in great good, and he believed that advance would occur along these lines. Furthermore every clinical professor of this kind must be trained not only to be an accomplished practitioner, but must also be proficient in the scientific aspects of his work; he must be prepared not only to work in the laboratory, but also to be able to conduct investigations himself. Again he thought that one of the most important things was to offer facilities for training young men, getting them ready for a scientific and professional career. Much of the work done must be done for the love of it and not for gain. It was impossible for one to be a real professor and at the same time attend to an extensive practice. What was really wanted was the means to help the young man to develop himself.

In his opinion the following reforms were most important:

1. Reduction in the number of medical schools, with adequate facilities for those surviving.

2. Insistence in university medical schools that the head of the department be a real professor, whose prime object is the care of hospital patients, the proper training of assistants and students, and the advancement of knowledge, rather than to be a prosperous practitioner.

3. Recognition by medical faculties and hospitals that obstetrics is one of the fundamental branches of medicine, that the obstetrician should not merely be a man midwife, but a scientifically trained man with a broad grasp of the subject.

4. The requirement by state examining boards that every applicant for license to practice shall submit a statement certifying that he has seen delivered and has personally examined, under appropriate clinical conditions, at least ten women.

5. Impressing university authorities and institutions that a



medical school is most expensive, and that they are not justified in conducting one which is not along ideal lines. Each main clinical branch will require a separate clinical institute, which, if properly equipped for the care of patients, teaching of students, and furthering of research, will require large endowment. It is the duty of those interested in medical education to impress upon philanthropic persons the needs along such lines.

#### DISCUSSION.

DR. EDWIN B. CRAGIN said that Dr. Williams did well in laying so much emphasis upon the fact that the way to improve the teaching of obstetrics was to improve the obstetrical teachers. Many of them had been obliged to train themselves in obstetrics, as well as in obstetric teaching. Many of them could look back twenty-five years and could realize that when they graduated at the end of their student life they had had no practical training in obstetrics. The only case Dr. Cragin ever saw before graduation was one that occurred in the country when he was on his vacation. This happened to many men who graduated twenty-five years ago and this meant that many teachers of obstetrics to-day had had to work out their own salvation. He said he was not quite as pessimistic regarding the teaching of obstetrics to-day as was apparently the guest of the evening. When one contrasted the teaching of this branch of medicine to-day with the teaching of years ago, it showed marked progress. When we considered that to-day a student at the College of Physicians and Surgeons himself delivered from four to nine women and witnessed from thirty to fifty confinements, one could faithfully state that this certainly showed a marked advance. Obstetrics had developed along surgical lines. The old teacher of obstetrics developed from the general medical practitioner and without any special surgical training. Then modern gynecology came on the field and developed along surgical lines. Then finally obstetrics developed along surgical lines, the so-called surgical obstetrics. This made very little difference between modern obstetrics and gynecology. The two had rewedded after being long divorced. This tendency was seen in the union of the two chairs under one head in many of our medical schools to-day. The duty of every teacher of obstetrics was to give his students and assistants the best training possible and the man who did not leave behind him men better trained than he himself had been was, in the judgment of the speaker, a failure.

Dr. Cragin believed that the obstetrician and the teacher of obstetrics of the future must be a man with a surgical training. He hoped that none of the Sloane Hospital men, who might be present, would take what he was about to say amiss, but for several years he had noticed that the men on the staff of the Sloane Hospital who had had a previous surgical service made better obstetrical internes than those with a purely medical training.

We all respected the training Dr. Williams had had along laboratory lines. Many of us rather envied it. Dr. Williams had certainly held up before us a high ideal when he recommended that the obstetric teacher should be a research worker devoting his time to his research laboratory, his wards and his teaching. Dr. Cragin believed that the college should have its own Frauenklinik and that the teacher of obstetrics and gynecology should spend a large part of his time in this hospital and in teaching, but he doubted if he would be as good a teacher in a practical subject like obstetrics and gynecology unless he kept himself in touch with private practice. Furthermore, if the teacher of obstetrics should devote his entire time to research work, his wards and teaching, his support would throw upon the trustees of the university a financial problem which might be more easily solved in Baltimore than in a city like New York. He believed there was a happy medium which would work to the advantage of everyone interested in the subject. Our ideals here in New York had been high and Dr. Cragin felt that in having an obstetrical and gynecological hospital in connection with the college and in giving the students both theoretical and practical instruction along these lines, with a sufficient number of cases to train them well in the methods they should follow, and in then allowing them, under proper supervision, to put in practice in the tenements the methods they had learned, a distinct advance had been made along the path of progress and that an optimistic view was justified.

DR. J. CLIFTON EDGAR said that all workers in obstetrics would appreciate the work done by the guest of the evening and be grateful to him for it. He thought that in the past, Americans were inclined to be too self-satisfied with medical progress in this country. The first report of the Council on Medical Education in 1905, gave the first jolt to this complacency, then followed Abraham Flexner with another, and this evening comes a third. Anyone who has read the last report of the Council on Medical Education for the year 1911, and published in August last, cannot but be impressed with the fact that certainly much has been accomplished during the past eight or nine years as regards medical reform. Some twenty-five medical colleges have closed. In 1911 alone, of thirteen colleges, eight suspended and five merged with other institutions. In 1904 a few thousand dollars were given for medical education, in 1911 several millions.

It seemed to Doctor Edgar that one reason why obstetrics had not profited by the reform in medical education as it should have, was due to the fact that it was the last of the seven fundamental subjects in medicine. Certainly reform had reached anatomy, surgery and physiology, and it was only a matter of time when it would reach obstetrics. The subject of obstetrics should have a higher standing to-day than it has, but the standing is such a marked improvement over that of a decade ago, that he was most optimistic about its future.

We should have higher requirements in the State Examinations for obstetrics. One thing that has belittled the importance of obstetrics in the Regent's Examinations is the fact that obstetrics, gynecology and diseases of children are still usually combined in one examination paper. The State, said Dr. Edgar, should require a definite number of confinements attended by candidates for license to practise before they are admitted to examination. As far as Dr. Edgar was able to find out but few of the states make such a requirement.

Both from the standpoint of the obstetrician and from that of the general public, Dr. Edgar was still optimistic as regards the future of obstetrics. There has been and there is deplorable work in obstetrics, but the same is true of other branches of medicine.

There has been a change in the attitude of the general public during the past five or six years. The general public is demanding better obstetrics, and beginning to appreciate their own and the responsibilities of their attendant.

They appreciate the fact that a case of obstetrics is a case of surgery; they grasp the importance of unfavorable symptoms; they are not as casual as heretofore; the prejudices and traditions surrounding obstetrics are passing away with the present generation. Dr. Edgar thought that all this had been partly brought about by the movement along preventive medicine, as emphasized by the work in the prevention of tuberculosis; in infant mortality and child welfare conventions; day nurseries; popular literature in magazines; and the far reaching educational influences of the newer maternity hospitals with teaching staffs. It was quite a significant fact that there was a tendency to establish more lying-in charities within the last few years. Within the last few weeks, he understood, that there were two applications before the State Board of Charities for licenses to establish out-door maternity charities in the city of New York; in one application the privilege was asked to teach students, and in the other to teach students and midwives as well. The speaker of the evening had only referred to the midwife question, and Dr. Edgar thought, that in New York at least it demanded serious consideration.

Dr. Edgar thought the problem a difficult one. He was in favor of the abolition of the midwife, and as that at present was not practical, then the next best thing was recognition, training and state control. We have been doing a lot of talking on the subject in the last twenty years and accomplished practically nothing, but we need not be discouraged when we remember that the London Obstetrical Society and the British Medical Association worked thirty years before the Midwife Bill of 1902 was passed to cover England and Wales.

The condition is deplorable in this country; thirty-three of forty-nine states and territories have no laws actually restricting the practice of the midwife. But work is going on to better the



condition. During the past summer one society interested in the matter sent its secretary abroad, to study the subject and report upon the same, particularly the situation in England. Hardly a year ago a School for Midwives was established in connection with the Bellevue Obstetric Service. At the end of six months eight midwives were graduated. Each saw sixty to seventy cases of confinement and personally delivered eight.

Dr. Edgar said he had found out that the midwives themselves were interested in this educational movement, and were appreciative of the fact that attempts to educate them were under way. Even eight educated midwives going among the uneducated ones would cause the latter to appreciate their deficiencies. In conclusion Dr. Edgar said that in teaching students he was in favor of what might be termed the personal equation. He did not believe that a teacher of obstetrics should hold his position who gave but a casual attention to his work. He understood there were institutions where so much work was done by assistants, that the students scarcely knew the head of the department other than by name. Consequently, Dr. Edgar believed in what were known as obstetric conferences.

It was not the man who graduates after witnessing twenty to thirty cases of confinement, nor the graduate from a large maternity who was always the best obstetrician, but the one who had while a student been taught to think out the why and wherefore of what he saw—to observe intelligently. Dr. Edgar's plan was to follow ward work or clinics with an open-minded and free discussion of the cases seen in which each student was asked to join, and to discuss and criticize diagnosis treatment and so on. As a result of these conferences, one third year student at Cornell had actually proposed a simplified method of geometrically obtaining the posterior sagittal conjugate diameter of the pelvic outlet, following the teachings of Rudolph Klein of Munich.

Another suggested a much simpler apparatus than the Draeger infant pulmotor for the resuscitating of the asphyxiated newly-born. Both this method and apparatus are to be published subsequently by the students.

DR. JAMES W. MARKOE said that he had been interested in the teaching of obstetrics for many years and felt that it would be well to remember that no further back than 1850, Dr. James P. White was the first obstetrician in America to deliver a young Irish girl before the graduating class of the Medical Department of the University of Buffalo. This greatly pleased the students but it was taken up by the profession throughout the country and raised such an uproar that it was proposed by some to pass laws forbidding physicians to deliver women and limit the practice to midwives.

Within the past twenty years there undoubtedly has been a great improvement in the methods of obstetric teaching but the system was by no means perfect. He did not believe that very



many physicians would take up obstetrics and limit themselves to confinements only, because the dominant feeling of to-day is money making and not much could be made out of obstetrics alone. He agreed with Dr. Williams that the ideal teacher of obstetrics was a man who was thoroughly trained, not only in the care of the patients but also was familiar with the laboratory side of the case.

Twenty-five years ago Dr. Clark made the statement that the only way a graduate gained his obstetric experience was from his private practice. At present it was believed that the best way of teaching obstetrics was not only in the hospital wards but in the tenements as well. In the last twenty-two years the Lying-in Hospital had cared for between eighty and ninety thousand women, which had provided instruction for some six thousand students and eight hundred internes. On looking over the records of the hospital he found that an in-door House Surgeon who completed the four months service cared for approximately three hundred confinements, but that the man who received the most satisfactory training was the House Surgeon of the Out-door service where in six months he had under his direct supervision some fifteen hundred cases.

In regard to midwives, the Lying-In Hospital had persistently endeavored to supplant the midwives by carefully supervised medical students and that this could be done throughout the country by increasing the number of just such lying-in charities. He did not believe that any person not a physician should be allowed to care for women during their confinement whose only training had been a six months' course of instruction with but ten or twelve cases during that time. He believed the obstetrics should be elevated to the same plane as surgery or medicine and that the granting of certificates to practice medicine to any but those that could pass the examinations required for the title of M. D., was a mistake. The question of allowing students of medicine to act in cases of midwifery had been very carefully gone into and decided in their favor, provided proper supervision was maintained.

The same question was before the profession to-day in regard to using trained nurses as anesthetists. He believed that this could only be done by making the operator or some competent physician responsible, or better yet, to induce female physicians to take up this line of work.

Dr. JOHN O. POLAK said he agreed with Dr. Cragin and Dr. Edgar that there had been a marked improvement in the teaching of obstetrics during the last twenty years. As matters stood to-day in this country our efforts for improvement should be along two lines, viz., an endeavor to turn out students who were competent and practical enough to be first class male-midwives, and to train assistants so that they could improve the obstetric teaching. At the present time it was very difficult to turn out students in this country who were com-

petent to handle women in confinement. Every one who had practised in the large cities, was impressed with the fact that many men were incompetent to care for these cases no matter from what school they came. Two important factors brought this about, (1) the subject of obstetrics has not attained the high position it should hold and (2) the remuneration received for obstetrical services was inadequate. The young practitioner who is getting almost nothing for the care of an obstetrical case, unless he is imbued with the scientific spirit, is very apt to become careless and do incompetent work. What was then the safest and best thing to do today? Many of these men receive three years instruction in obstetrics; they are shown how to confine women, and they are sent out to confine women themselves, under the instruction of a resident or assistant, yet the average graduate, as soon as he gets out is unsafe, unless he is saved by his conscience. It is necessary therefore, first, to develop the student so that he may become a safe physician; second, to instruct the assistants and train them so that they may be successful teachers. These two points in conjunction with an increase in lying-in charities and the resulting increase in clinical material would result in the greatest good.

DR. ROBERT L. DICKINSON said that Dr. William had not alluded to one important section of his January paper. The best stimulus to induce strong men to take up the teaching of obstetrics would be its bracketing with gynecology. When a prominent and successful teacher and practitioner, brought here from Scotland by way of Canada to hold a joint chair was asked, after he had had time to get well under way, how his work was going, he exclaimed, "I enjoy greatly the most interesting department to teach there is in all medicine—obstetrics. But I make my living out of gynecology." The speaker had been informed that even in Germany, where the Congresses showed so broad a point of view in such splendid symposia on obstetrical subjects by the professors at the head of the combined departments, these great men sometimes exhibited in the wards an ignorance of detail that showed that they left most of the midwifery to the assistants.

The surgeon looks down upon the gynecologist and tries to crowd him out. The gynecologist looks down upon the obstetrician. The student will never get good obstetric teaching until the obstetrician is both gynecologist and surgeon in his training, his opportunities and his fees. Poor pay means cheap workmanship. Enthusiasm provides a few strong men at small salaries, but these must always be the exceptions. Therefore, to the speaker's way of thinking the only practical way of radically bettering obstetrics and obstetric teaching was the combination of the obstetrical gynecologist or the gynecological obstetrician. At Brooklyn Hospital the two departments had been combined in the following manner. The chief, who had come into gynecology through the door of obstetrics, but up a

surgical staircase, was senior over both. The personnel of the two departments would change places on the first of January of each year. Thereby the Visiting, the Associates, the Clinical Assistants, and the Dispensary Staff, would, it was hoped, all be better obstetricians and better gynecologists.

DR. GEORGE P. SHEARS was inclined to agree with those who regarded Professor Williams as being too pessimistic. It had recently been his privilege to examine forty candidates for the position of interne at the City Maternity and he had been surprised at the good showing which they made.

By what method of psycho-analysis did Dr. Williams discover the motives of these who took up obstetrical teaching? Certainly the fees were less than in surgery or gynecology. The responsibility of the obstetrical operator is greater than that of other operators because he holds in his hands the fate of two lives. What led Dr. Shears to take up obstetrics was that he believed it to be the highest and finest of all branches of medicine.

As to the surgical tendency in obstetrics, the obstetrical teacher ought to be qualified in surgery, but the man who thought surgery the most important thing was as a rule weak in subjects purely obstetrical, for instance, the forceps operation.

The surgical tendency in obstetrics had not always been productive of good. Curetage for puerperal infection had done incalculable harm. New operations were dropped almost as fast as they were taken up. A thorough knowledge of the use of the axis-traction forceps would save more fetal lives in one year than would the various cutting operations in a decade.

With reference to what Dr. Williams had said about obstetrical teaching in Germany it is true that with State endowments they have advantages which we do not have here. Nevertheless in our own country in which the first Cesarean Section and the first ovariectomy were done there is no reason for despair as to the future of obstetrical teaching.

Dr. J. WHITRIDGE WILLIAMS, closing the discussion, said that he was sorry that he gave the impression that he was pessimistic because he was not; but he was more or less a skeptic. He realized what had been accomplished during the past twenty-five years and he was somewhat skeptical about the future. He had, however, great hopes for the future; they had done much in the past and they would do more in the future. He wanted to see things developed in this country along proper lines. Develop obstetrics, teach obstetrics and combine surgery with obstetrics, and science with both of them. He could not but feel that a man could not be a competent teacher of obstetrics who was a general practitioner. He might be a first rate operator but he could not face the subject from a scientific aspect for he had no time to develop and place the true scientific subject on its proper basis. What they had to do in the conduct of this work was to educate the trustees of the University that obstetrics was an important branch of medicine and what they wanted were



men who had the goods on them and who could deliver them as teachers of obstetrics. They could not well combine practising medicine and teaching obstetrics; a man who was an ideal teacher made less money than if he devoted himself to practising. These men should have a good salary; they must have a good salary in order to be able to properly raise their families in moderate comfort. They should not expect a man with a good reputation to take a professorial position unless he was paid a fair salary which was in proper proportion with the salaries paid to professors of the other branches of medicine.

What they should first attempt to do was to educate the board of trustees and that would come in time.

With regard to midwives, they could not properly be trained in four months. He had followed them abroad in Germany and in France and he was told there that they were failures. The only thing to do was to get rid of them gradually by means of a marked extension of the out-door medical charities. They must face the question of medical socialism. The first proposition was to take care of all the people who could not afford to obtain proper medical attention. The rich man got what he paid for and because he paid for attention; the poor man got it because someone else paid for the attention given him; but the middle man who could only pay a little for attention as a rule got what was bad. How to care for these latter people he did not know except it be at out-door obstetric charities, or lying-in hospitals; these would apply to husbands who were making say five hundred dollars a year and who with this small amount had to support families.

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#### SECTION ON OBSTETRICS AND GYNECOLOGY.

*Meeting of May 23, 1912.*

FRANKLIN A. DORMAN, M. D., *in the Chair.*

#### INTRAMURAL ABSCESS OF THE PUERPERAL UTERUS. INTRA-PERITONEAL RUPTURE. HYSTERECTOMY AND RECOVERY.

DR. ANTHONY HART HARRIGAN reported this case. The patient was a woman who had given birth to a child four days previous to her admission to the hospital. She had had a severe chill, fever, pain in the lower abdomen, cough and a bloody ill-smelling lochial discharge. The uterus was enlarged and boggy, reaching to a level half-way between the umbilicus and the symphysis. There was moderate tenderness over the fundus, but no rigidity. The skin was mottled, pale, and anemic. The cervix was soft and dilated about three fingers; the foul discharge contained clots and small pieces of necrotic placenta. Upon opening the peritoneal cavity a large mass was found consisting of uterus and adherent sigmoid colon occupying most of the pelvis. On stripping the sigmoid colon, a large abscess



with necrotic wall was found on the posterior wall of the uterus, which had ruptured into the parametric tissues. The tubes and broad ligaments were clamped and cut at the ovarian ends. The ovaries were normal. The uterus was completely removed, leaving a cervical stump. The peritoneum over the uterus was necrotic and friable and much hemorrhage occurred, especially at the site of the left uterine artery. The peritoneum was sewn with chromic catgut over the cervical stump. There was no drainage. Although there was free discharge of pus from the wound, the patient finally made a good recovery.

The report of the pathologist showed that the uterus measured  $6 \times 8 \times 13$  cm. It weighed 250 grams. The walls were thickened and on the anterior surface, the entire left side was replaced by a large necrotic mass. The left ovary and tube were adherent to the mass posteriorly. The mass did not show any connection with the endometrium. Microscopically the section showed a large area of complete necrosis. The muscle cells showed extensive round cell infiltration and well-marked cloudy swelling. Two small areas of focal necrosis were found between the muscle fibers. The blood-vessels were markedly congested. There was a moderate amount of new formed fibrous tissue throughout the section.

DR. F. A. DORMAN had not seen more than one case of that type and that one Dr. Boldt operated upon. Dr. Dorman asked Dr. HARRIGAN what was the temperature and if any cultures had been taken.

DR. HARRIGAN replied that the temperature ranged between 99 and 103.2 F. Cultures were not taken.

#### PARTIAL EXCISION OF THE BLADDER FOR CARCINOMA.

DR. ROBERT T. MORRIS reported the case of a patient about fifty years old with much blood and pus in the urine. Dr. H. D. Furniss made the cystoscopic examination and discovered a growth and the question at once arose what should be done. It was finally decided to open the abdomen; the bladder was drawn out and split in half; the right ureter was transplanted; now the patient had a sausage-like bladder with a transplanted ureter. The patient was a woman, had a capacity of 5 ounces and could retain her urine 2 hours.

#### ECTOPIC GESTATION IN AN ANOMALOUS TUBE.

DR. M. M. STARK reported the case of a patient, twenty-seven years old, who had a child two years ago, with an instrumental delivery. Her puerperium was uneventful. Her menses had since been regular and normal. Three weeks after her regular menstruation, on April 13, she began to bleed. She had no unusual discomfort. On April 21 she had a very severe attack of pain in the epigastrium; after being in bed a few hours she felt as well as ever. A mass was discovered which was of the size of the specimen presented. Three days later, on April 24, she

had very sharp and severe pains, was in a condition of collapse, had abdominal discomfort, rectal tenesmus and the abdomen became much distended. A diagnosis was made of an ectopic gestation and she was at once operated upon, the usual operation being performed. The source of her trouble was on the left side; the ovary on the opposite side was removed. A diagram of the specimen was presented which showed the ectopic gestation in an anomalous tube. The ostium was patulous.

THE RELATION OF ATHLETICS TO THE REPRODUCTIVE LIFE  
OF WOMEN.\*

DR. ANGENETTE PARRY read this paper.

DISCUSSION.†

DR. C. WARD CRAMPTON, Director of Physical Training and Secretary of the Public School's Athletic League, said that inasmuch as the Department of Education had to do with 350,000 girls and young women it had studied the matter of athletics with much care. The physical and social differences between boys and girls were recognized to be of paramount importance in determining what exercises should be given to girls, and the endeavor to adapt boy's athletics for girls had been definitely abandoned. The strenuous athletic competition in which boys naturally indulged fitted them for the strenuous masculine life; the life of women was entirely different, and, therefore, the physical activities in which girls would naturally indulge under normal circumstances were taken to be the guide for this important practice. It was early determined that such things as folk dances fulfilled the conditions imposed by girlhood better than any other procedure. These provided vigorous exercise, happy recreation, and trained girls to be graceful as well. Since these dances were primarily of the peasant type, the movements were vigorous, involving the larger muscles of the body. The rhythmic jar involved was mild enough not to damage the various sustentacular abdominal ligaments, but just sufficient to strengthen them materially. These two results he deemed to be of paramount importance. The weak, flabby abdominal muscles of the women of yesterday and perhaps of those of today did not support the abdominal contents. The carefully guarded life of civilized women weakened their natural abdominal supports. The wearing of corsets provided an artificial support, splinted the abdominal wall and relieved the anatomical structure of much of its responsibility. The results were weak abdominal ligaments, general visceral ptosis, and constipation, with their train of gynecological and toxic disturbances. This condition, the use of the folk dances tended to eliminate, not only during school practice but during future life. The combative element

\* For original article, see page 341.

† The remainder on Dr. Parry's paper was unavoidably omitted by the stenographer present at the meeting.

so prominent in the boy's basket ball game had been robbed of its characteristic violent personal contact in its adaptation for girls. Other games of similarly appropriate nature had been introduced and the team element with the emphasis on cooperation had been made prominent. Girls liked to run and jump in imitation of their stronger brothers and it was deemed proper that they should be able to do something of this form of athletic work. Individual competition had been discarded as he did not desire the girl to bear the almost hysterical responsibility involved in running a hundred yard dash for the purpose of winning a championship, nor did he desire her to subject herself to the tremendous jar involved in a running broad jump. They rather encouraged long walking trips into the country and preferred to train girls to swim well. He did not believe that violent and dangerous feats should be introduced into the public schools. If they desired to train their young women into athletes this might be appropriate. It was no doubt very well for students in the normals schools to compete in such manner, but until they had to develop their young women to a physical resistance comparable to that of the trained masculine athlete, they should not subject them to any such strain. It was more important to train young women to be vigorous and somatically sound than to train them to do unusual and strenuous athletic feats.

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## REVIEW.

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**DUODENAL ULCER.** By B. G. A. MOYNIHAN, M. S. (Lond.), F. R. C. S., Senior Assistant Surgeon at Leeds General Infirmary, England. Second edition, enlarged. Illustrated. pp. 486. Philadelphia and London: W. B. Saunders Company, 1912. Cloth, \$5.00. Half Morocco, \$6.50.

This volume presents a clear exposition of the history, pathology, symptoms, diagnosis, prognosis and treatment of duodenal ulcer, a comparatively common and important condition of which our practical knowledge in the living dates back only about a dozen years and is due largely to the labors of the author of this book. He has clearly shown that symptoms the older physicians believed to be due to derangement of the functions of the stomach, as hyperchlorhydria, or neuroses with "hunger pains," are really due to organic disease and that of the various forms of this organic disease duodenal ulcer stands out the most clearly. The operative treatment, which has proved to be so wonderfully successful in its author's hands, is admirably described and illustrated. A detailed statement is given of the symptoms and results in 350 cases operated upon by the author.

The more important changes noted in this second edition have to do with the differential diagnosis of duodenal ulcer and x-ray examinations of the stomach after a bismuth meal. The book is one that must be read by every one who wishes to keep abreast of the advances in the surgery of the abdomen.



## BRIEF OF CURRENT LITERATURE.

### OBSTETRICS.

**Death of the Child due to Rupture of Umbilical Vessels during Labor.**—H. Williamson (*Jour. Obst. & Gyn. Brit. Emp.*, 1912, xxi, 203) says that the essential anatomical feature of a velamentous placenta is the termination of the cord at some distance from the placental margin, the vessels diverging from one another and running over the chorion lœve for a greater or less distance. The writer records a case in which the umbilical artery which ruptured was not a vasa previa, and the branch of the umbilical vein which corresponds to the ruptured artery was thrombosed throughout the greater part of its length. In cases of this type the diagnosis can be made early in labor if pulsating vessels are felt running across the presenting pole of the bag of membranes. After bleeding has commenced the condition is usually mistaken for placenta previa or accidental hemorrhage; in one or two instances, however, suspicion has been aroused because, in spite of severe bleeding, the mother showed none of the signs or symptoms of hemorrhage. Williamson suggests the possibility of confirming the diagnosis in such cases by microscopical examination of a film of blood, the demonstration of nucleated red corpuscles would prove that the child was bleeding. When diagnosed early in labor, the best chance of saving the life of the child lies in Cesarean section or in vaginal section, but when the vessel has once ruptured the life of the child is so precarious that it does not seem justifiable to subject the mother to the risk of operation.

**Thyroid Disease in Pregnancy and Parturition.**—E. P. Davis (*Amer. Jour. Med. Sci.*, 1912, cxliii, 815) reports four cases of this class. He says that in examining cases of pregnancy, the condition of the thyroid gland should receive attention. If this be manifestly enlarged or altered the patient's nitrogenous metabolism should be closely watched, and if evidences of lack of thyroid secretion be found, the active principle of the glands should be administered, best in small doses, 1 grain three times a day, continued for from four to seven months. Our most reliable methods of ascertaining the patient's condition, are nitrogen partition of the urine and the clinical study of the condition of the circulation. Pulse tension varies so greatly that it is not a constant and reliable factor in diagnosis. The wishes of the parents should be carefully ascertained regarding the life of the child, and the situation clearly explained to them. Where children have been lost in previous pregnancies, and the parents



are desirous of offspring, all possible means should be used to continue the pregnancy, without undue risk to the mother. If there is a history of enlargement of the thyroid during labor, with the development of unfavorable mechanism and loss of the child through birth pressure, elective Cesarean section before labor should be selected. No case should be considered as convalescent, or receiving adequate attention, in which the patient after recovery from parturition does not seek surgical advice and treatment to permanently remedy the thyroid condition. The induction of labor in these cases is seldom indicated as it is too slow and uncertain. The pressure of elastic bags increases the mother's nervous disturbance, and delivery of the child through a partially dilated birth canal exposes it to additional risk. In cases where degeneration of the thyroid gland does not seem to be present, but an increased secretion of thyroid material is formed, absolute rest and milk diet, sedatives, and the application of ice over the gland, should be immediately employed, with the hope of improvement until the child can become viable. As reported cases show, it is sometimes possible to check the thyroid activity by this means, and to bring the patient to a safe and spontaneous termination of pregnancy.

**Enlargement of the Pelvis During Pregnancy.**—H. Loeschke, (*Arch. f. Gyn.*, Bd. xcvi, H. 3) presents the results of an investigation undertaken for the purpose of determining whether the pelvis undergoes changes during pregnancy and labor, whether it constitutes a rigid, bony girdle or whether and to what degree it is capable of dilatation during labor. The preliminary observations deal with the question of a relaxation in the symphysis and the possibility of joint formation in this organ. He then considers the question of the degree of pelvic enlargement and that of a general involvement of the entire osseous system during pregnancy. Loeschke claims that no actual diaphysis exists at the symphysis and that this is normally without any cleft. The static relations of the pelvis vary in children and adults and the symphysis of the adult is subjected to a relative and well marked increase in pressure greater than that of the child. If clefts appear in the symphysis they must be divided into two varieties, the first of which are the result of a degeneration of the articular disc, appear in adults of both sexes with an equal frequency and are limited to this structure. Traumatic cleft formations on the other hand are present only in women who have borne children and are not limited by any anatomic boundaries and result from trauma during labor. The author finds that during labor the symphysis is subject to well-marked stretching and that the increase in the pelvic inlet may amount to several square centimeters. The sacroiliac synchondrosis assumes the rôle of a joint during labor. In every pregnancy a permanent increase of the pelvis results from new growth of the bones. In multipara, cases were observed where the increase at the symphysis amounted to more than two centimeters which provided

for an enlargement of the pelvic inlet of at least fifteen square centimeters. A similar increase may also be demonstrated in the sacroiliac articulations, which aids in the increase in size referred to. Loeschcke believes that the growth of the pelvic bones during pregnancy is part of a stimulus which involves the entire osseous system and results from internal secretory processes developed in the ovaries, the thyroid and the hypophysis.

**Labor in Aged Primiparæ.**—H. Fourdinier (*Jour. des sci. méd. de Lille*, June 8 and 15, 1912) gives his experience in the results of labor in primiparæ of advanced age. Labor has always been considered to be unusually difficult and dangerous and a bad prognosis has been given. The author gives the results of observations of primiparæ from the age of thirty years to forty-six years at the St. Anne Maternity. Out of 10,000 women in labor 237 were between thirty and forty-six years of age; there were 234 simple and twenty-three twin pregnancies. Out of these, 221 were head presentations, seven breech, and four shoulder. In 172 primiparæ from thirty to thirty-five years of age, 76 per cent. were normal, twenty-four terminated artificially, the average duration being sixteen hours. There were sixty-five women between thirty-six and forty-six years of age, of whom thirty-six were delivered spontaneously and twenty-nine artificially. Of the twenty-nine who were delivered artificially the duration was thirty-two hours on the average. The mortality in this series was 1.53 per cent. for the mother and 15 per cent. for the child. The author concludes that of 100 primiparæ of advanced age three-quarters will be delivered normally, after a relatively short labor; but the other fourth will be exposed to the dangers of a long and laborious delivery. The cause seems to be a rigidity of the soft parts, causing resistance to the contractions, and a degeneration of the muscular fibers of the uterus itself, which renders the contractions less forcible than normal.

**Treatment of Retained Membranes.**—R. Roeder (*Monatsschr. f. Geb. u. Gyn.*, June, 1912) has studied the material from the Alexandria Institution for women in St. Petersburg, included in a period of fifty years. Retention of the membranes occurred in 1476 out of 13,986 labors, that is, in 10.55 per cent. of all cases. As the result of careful observations during the subsequent puerperium, Roeder finds that the morbidity percentage was 13.46 per cent. with conservative treatment, 20 per cent. in cases cleaned out postpartum and 78 per cent. in cases cleared out during the puerperium on account of the presence of fever. Moreover, serious results in the conservative treatment were observed in only 1.1 per cent. of all the cases, whereas this was increased to 26.5 per cent. where active treatment had been employed. The mortality with active treatment was found to be over fifteen times greater than with the conservative and for this reason, the writer strongly advises against any intrauterine interference in cases where the membranes have been retained. The only exception is in those cases where serious hemorrhage is

present. Stress is laid on the prophylactic treatment, allowing sufficient time for the expulsion of the placenta and avoiding massage of the uterus after labor except in the presence of distinct indications.

#### GYNECOLOGY AND ABDOMINAL SURGERY

**Effect of the Roentgen Rays on the Anatomical Structure of the Uterus and Ovaries.**—R. Meyer (*Zent. f. Gyn.*, April 27, 1912) finds that in six cases of myomata of the uterus in women of from forty-three to fifty years, the treatment with the x-rays had had no effect on the uterine hemorrhages. Notwithstanding this, the histological structure of the tumors was found changed, including a marked atrophy of the myoma cells, with sclerosis and moderate hyaline degeneration of the fibrillæ. In addition, the vessels, especially in the outer portions of the wall, were markedly sclerosed. The changes in the ovaries were less marked, consisting in degeneration of the cells and a few follicles, a change which may, however, be an accompaniment of the particular period of life in the women examined. Notwithstanding the apparently elective action of the x-rays on the structure of the myomata, the hemorrhage was not affected, because other unknown etiological factors were probably concerned. The author is very sceptical regarding the effect of the x-rays on the ovarian tissues as a therapeutic possibility in the treatment of uterine hemorrhage.

**Transplantation of the Ovary.**—E. Engel (*Berl. klin. Woch.* May 20, 1912) in discussing the treatment of artificial menopause symptoms, reports a case in which these practically disappeared after this operation. The patient, a woman of twenty-seven, never pregnant, had had both ovaries removed, together with a supravaginal amputation of the uterus. Severe climacteric symptoms followed, for the relief of which a healthy human ovary was implanted by the vaginal route in the stump of the uterus. The patient's symptoms gradually subsided and she is stated to have made a complete recovery.

**Histological changes in the Uterus Following the use of Oxytoxic Substances.**—F. La Torre, (*Gyn. Rund.* Bd. vi, H. 10) presents the results of his observations on 100 dogs in which he employed the following substances: dialysed ergotin, hydrastinin, stypticin, viburum, metranodin and gelatin. The main point in his experiments was to determine whether these substances produced any anatomic effect in the uterus, based on careful examination of microscopical sections. The ergotin was found to affect all the muscular elements and produced contraction or retraction in a centrifugal direction, including the tetanization of the same and dilatation of the uterine cavity and the lumen of the vessels. Stypticin manifested its effects almost exclusively on the muscular elements of the vessels and effected a contraction of the vessels with a more or less complete occlusion of their lumen. These varied effects produced the same therapeutic result, although



the mechanism is different. Moreover, the ergotin interferes with the flow of the blood to the mucous membrane by contracting the vessels which run through the inner muscular layer, whereas the stypticin accomplishes this same result by a more or less complete closure of the larger vessels. It is also interesting to note that ergotin exerts a stronger action on the muscle fibers if these have become changed, either by pregnancy or any other process resulting in hypertrophy, while the muscle fibers of the uterus in its quiescent stage are very little affected. The stypticin on the other hand, manifests its effects only on the vessels, independent of the condition in which the uterus may be. From this it seems to follow that in any hypertrophic conditions of the muscular elements of the uterus, ergotin will give good results if the administration is not too prolonged, while stypticin will be followed by good effects where the muscular fibers are normal. Hydrastinin, viburnum and gelatin produce very slight and noncharacteristic changes and seem to be of little practical value. Hydrastinin and viburnum do, however, bring about some contraction of the uterine tissues but gelatin seems to have no effect in this direction. Metranodin, which is a fluid mixture of hydrastis, viburnum, dialysed ergot and cannabis indica, is claimed by the writer to unite the effects of ergot, viburnum and hydrastis, and brings about a slight reduction of the muscular mass and especially of the inner layers, so that the blood does not reach the mucous membrane. There anatomical findings are claimed to be supported by clinical observations in dysmenorrhea and metrorrhagia.

**Sacral Anesthesia.**—Filippo Ambrosini (*Ann. di ostet. et gin.*, May 31, 1912) advocates the use of sacral anesthesia in all operations undertaken on the vagina or perineum, and in many on the cervix. He believes this method more practical than lumbar anesthesia, because the entrance of the needle is below the nerve roots and injury to the fibers, causing temporary paralysis, cannot take place. If the patient be kept in an upright position after the injection, the action of the injected drug can be limited to the parts desired, the liquid remaining outside the membranes and not passing upward in the spinal canal. The injection can be made with the patient in the sitting posture, the head and trunk being flexed. Stockel used sacral injections in 141 pregnant women, with negative results in 18, doubtful in 11, and excellent in 111. The author made use of sacral anesthesia only in gynecological cases; he made a solution of bicarbonate of soda and chloride of soda in distilled water, into which he put, just before injecting the solution, the prescribed amount of novocaine. He reports fifty cases, mostly vaginal, seven being Adams-Alexander operations. The pain of the injection is quite endurable by the patient. The first region to become anesthetic is the anus, then the labia majora, anterior and posterior walls of the vagina, cervix and mons veneris. There are frequent anomalies in the method of extension of the anesthesia.



It was good in all the plastic vaginal operations and in the perineum. In vaginal hysterectomy when the peritoneum was touched the patient winced. The duration varied from thirty minutes to two hours. The patients, when asked during the operations, said that they had no pain at all. This method of anesthesia has none of the disadvantages of ether and chloroform; there being no vomiting, no bad effects on the heart and kidneys, and no paralysis. In eleven of the patients operated on by the author, the anesthesia had to be supplemented by a small amount of ether.

**Creation of a Vagina in Congenital Absence.**—E. Juvara (*Rev. de Gyn. et Chir. abd.*, May, 1912) considers the best method of making an artificial vagina when one is congenitally absent, the use of a segment of the small intestine separated from the gut with a segment of the mesentery and transferred to a position created by separation of the layers of the region between bladder and rectum. The creation of a vagina in this location by the use of skin and mucosa from vulva and neighboring regions is generally a failure, because of the contraction of the tissues which occurs after operation, making the new vagina useless. The segregated portion of intestine forms a vagina which serves all necessary sexual purposes perfectly, and satisfies both husband and wife, while the patient loses none of the advantages of the normal genital organ or of its sensibility. Up to the present time seven cases operated on by this method have been published, to which the author adds an eighth. All these patients have been satisfied with their results. Of course this operation is more delicate and serious than the others heretofore proposed, but its advantages outweigh its dangers, and no bad results have thus far been obtained. Baldwin and Mori are the two surgeons who have proposed this method. It obviates the necessity of a second operation, even a small one, which is necessary by the other methods. The author first made the separation of the rectovaginal space into which the intestine was to be inserted. He then opened the abdomen, selected a coil of the small intestine, which, with its mesentery, he isolated and cut from the rest of the intestine, closing both ends with sutures. The ends of the remaining gut were reunited with a button. The separated portion was twisted into its place, the abdomen closed, and the new vagina sutured into the space between bladder and rectum which had been prepared for it, and sutured to the skin externally. The result was excellent.

# DEPARTMENT OF PEDIATRICS.

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## ORIGINAL COMMUNICATIONS.

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### COURSE, PROGNOSIS AND TREATMENT OF ENDOCARDITIS IN CHILDREN.\*

BY  
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To consider the subject of endocarditis in much detail would be a very large undertaking and I propose to give only the salient features of the etiology, course, prognosis and treatment of the endocardial affections of childhood. I have nothing very original to offer, but a review of what we already know is sometimes helpful, especially if one can emphasize some features of this subject that have been perhaps too lightly regarded. I have brought this subject to your attention for several reasons. One is the commonness of this affection in the young; another is the frequency with which an endocardial affection in a child will go unrecognized unless for some other disease a physical examination is made; and, third, the gravity of this disease in the young child; its frequently rapid course and the very often unfavorable prognosis that must be given in these cases. Not only the general practitioner, but also the specialist frequently sees young patients for other diseases, and finds upon careful physical examination some form of valvular disease. No symptoms of endocarditis were present, and no discomfort was produced by the abnormal heart. We are all more or less cognizant of the commonness of both acute and chronic endocarditis in the young child and indeed an acute endocarditis may occur even in fetal life. In this case it usually affects the right heart and is said to be one of the causes of congenital malformation of the heart. For instance, pulmonary stenosis which is said to be the most common congenital lesion.

This paper, however, is only concerned with what occurs after the birth of the child, during the period of infancy and child-

\*Read before the West Side Clinical Society, May 9, 1912.

hood. In infancy this disease is extremely rare and is uncommon up to about three years of age. It occurs more frequently from three to five years and after five years of age is quite common. Although acute inflammation may affect any part of the endocardium, in extrauterine life the left side of the heart is most often involved and the mitral valve much more often than the aortic.

An acute endocarditis may occur in early childhood and after a short period—during which time a distinct murmur is heard over the site of the affected valve—in most cases the mitral, the inflammation may subside leaving no permanent change or at most only a slight valvular thickening which may not interfere with the function of the valve. These cases of spontaneous cure, are, however, extremely rare and might easily pass unnoticed because of their short duration and the absence of symptoms other than the murmur pointing to the heart as the site of trouble; the child having simply a rise of temperature ushered in by vomiting, and unless care be taken in the examination the heart murmur may be undetected. Therefore, when called to attend a child with fever in the absence of symptoms pointing to other conditions, the heart should be examined with special care. Much more often is it the case that an attack that is apparently not serious at first turns out to be the beginning of progressive changes in the valves of a chronic inflammatory nature. The so-called primary cases of acute endocarditis in infancy and childhood have been the subject of much discussion as to their origin, but Holt agrees with those who regard the great majority of these as rheumatic and we may, I think, properly look upon them not as a complication of rheumatism but as a manifestation—often the first—of that disease. After the fifth year an acute endocarditis becomes much more common and we are able to demonstrate it much more surely as a secondary disease. The etiology of this affection in children is, according to Holt and Kerley, rheumatic in about 90 per cent. of all cases.

Reviewing briefly the sites of inflammation we find that the mitral valve is the one most frequently attacked and that mitral insufficiency alone occurs in about 70 per cent. of cases; that stenosis of the mitral valve may occur alone—usually we find it in combination with an insufficiency; that aortic stenosis is uncommon in early life, and rarely occurs as the only lesion, being usually associated with mitral insufficiency. Holt states that aortic insufficiency is one of the rarest valvular lesions in

children. Tricuspid insufficiency is usually secondary to disease of the left side of the heart and occurs in its later stages. As regards sex, Holt found that the difference in sex is very nearly the same as that found by him in his cases of rheumatism. Females predominate, about 62 per cent. to 38 per cent. of males. Probably the fact that chorea is twice as frequent in females as males accounts for this preponderance of the endocarditis in females.

Besides being seen as a frequent complication of both acute and subacute rheumatism it is found preceding, accompanying or following chorea and the same relationship may be found between an acute tonsillar affection and endocarditis. It is seen occasionally in the course of nearly all the acute infectious diseases, most often with scarlet fever. In the infectious diseases and in pleurisy and pneumonia the endocarditis is probably excited by pathogenic germs.

As regards the pathological changes in endocarditis; we have, of course, the changes at first of an acute inflammation, which as I have mentioned may subside leaving the valve structure practically unchanged. But what usually takes place is the formation of new connective-tissue cells with an infiltration of round cells beneath the endothelial layer resulting in masses of granulation tissue upon the valves or the endocardium of the heart wall and upon these, masses of fibrin may be deposited. These are the so-called vegetations resulting in swelling and shortening and consequent insufficiency of approximation, or else stenosing of the valve aperture. Ulceration of these vegetations may follow, or organization and cicatrization.

There are some difficulties occasionally met with in arriving at a diagnosis of endocarditis. For instance, a diagnosis of an endocarditis of the wall of the heart cannot be made early because the valves are not affected until they become incompetent following dilatation and we may, if not careful in examination, confound the murmurs caused by a pericarditis or even a functional condition, with those produced by a true valvular affection. Our principal guides are the place of the murmur in the cardiac cycle, the quality of the murmur and its location, its intensity and the area over which it is heard, and the effects upon it of respiration, exertion or position. Careful examination cannot very well confuse the to-and-fro friction sound of a pericarditis with the more definite blow of a valvular murmur. I might say here that Broadbent and others have noticed in



children who have just passed through an attack of pericarditis a rumbling murmur near the apex that suggests a mitral stenosis. It is to be differentiated from this condition, however, by the absence of any accentuation of the first apical sound as well as by its transiency. Usually the endocardial murmur is diminished by full inspiration while the opposite is true as regards a pericardial rub or functional murmur. Functional murmurs are quite commonly found in young children during any febrile attack. They are, however, to be distinguished by their location at the base of the heart, although they are occasionally heard at the apex. Usually they are heard loudest over the pulmonary area; their inconstancy and irregularity as to time and transmission also point to their being functional. Cardiorespiratory murmurs although not very common in children can usually be detected by their absence during some phase of respiration. The true endocardial murmurs are usually transmitted, the direction, of course, depending upon the valve affected, but usually beyond the border of the heart and usually to the left because we most commonly have a mitral valve affection. Cabot says that in children the murmur of a mitral regurgitation may be among the loudest of all murmurs to be heard in valvular disease, but this does not mean that the lesion is necessarily a severe one. A murmur which grows louder under observation may mean an advance of the disease, but if the case is first seen after compensation has failed a faint whiff in the mitral area may mean the severest type of lesion. As the heart improves in tone the murmur may grow much louder or a murmur previously inaudible may appear. This observation it seems to me is not alone applicable to children. I have seen the same thing happen in grown people again and again. He also states that in acute endocarditis when vegetations are rapidly forming and changing their shape upon the valves, murmurs may appear and disappear very suddenly. This changing character of the murmurs when taken in connection with other physical signs may be a very important factor in the diagnosis of acute endocarditis.

A word as to the general symptoms of acute endocarditis. The disease usually begins abruptly, ushered in by a vomiting spell and a rise of temperature, prostration, exaggerated heart action and dyspnea. These, of course, are symptoms not distinctive of any one disease, and it is not until the heart is examined that the true trouble is discovered. We may have

our suspicion because of chorea or rheumatic symptoms present at the same time or having preceded these acute manifestations, but the heart examination is the crux of the situation. A murmur may not be heard for several days after the onset, and then we usually get the soft blowing systolic murmur at the apex, transmitted to the left. When the endocarditis occurs in conjunction with an already present articular rheumatism there may be an increase in the fever and the severity of the general symptoms. An endocarditis complicating the infectious diseases is recognized only by its physical signs. The course of acute endocarditis may be that of acute inflammatory diseases in general, that is, have a duration of from one to three weeks, the fever lasting possibly only a few days and the cardiac symptoms slowly diminishing. It is possible for the attack to end fatally in a few weeks, due to a rapid dilatation of the heart with its inevitable signs of cardiac insufficiency, dropsy, cyanosis and pulmonary complications. Cerebral embolism is possible followed by a hemiplegia. This, however, is usually not fatal. Emboli might lodge in the spleen or kidney followed by the usual results. As stated in the beginning of the paper, the murmur may last but a few weeks and then disappear—a rare result. Usually there follow the changes in structure leading to permanent valvular incapacity which may have their beginning immediately after the first attack of endocarditis or after a considerable interval of time.

The fully developed chronic valvular disease of children as we frequently meet it often covers quite a period of time, sometimes years, during which repeated attacks of acute inflammation have aggravated the condition. This is the particularly grave part of the disease. Endocarditis is in my opinion one of the conditions that no matter how slight it is in the great majority of cases, is simply the beginning of a progressive chronic inflammation. In the chronic endocarditis of children there is practically the same picture that we are familiar with in our observation of the heart disease of adult life. We have mitral insufficiency or stenosis, aortic insufficiency or stenosis, occasionally tricuspid or pulmonary valve affections, and the combination of two or more of these at the same time. The same rules apply to a diagnosis of these conditions as to the acute affection—the same etiology can be demonstrated with the added progressive chronic inflammatory changes.

What is the prognosis and treatment of this disease? We can

generally give a favorable prognosis in an acute attack as such. Usually rest in bed for a variable length of time depending upon the severity of the affection, with suitable diet, consisting chiefly of fluids given in small amounts and rather frequently; an ice-bag over the precordium, attention to the bowel function and the use of the salicylates in practically all cases except those following diphtheria and the exanthemata, covers in brief our mode of treatment. Kerley, in speaking of rest in the recumbent position, discourages the use of the arm and hand early in the attack, insisting upon absolute rest of the whole body. This is a point to consider and to obtain if possible.

The prognosis of chronic endocarditis depends largely upon the method of treatment and care between the acute attacks. We must go back as far as we are able in the etiology and usually our search will reward us with a history of one or more attacks of articular rheumatism, tonsillitis, or chorea, or possibly only a history of so-called growing pains, but in the great majority of cases we will find a fairly clear-cut picture of a rheumatic diathesis. Occasionally, of course, we get a history of diphtheria, pneumonia or the other infectious diseases. We must remember that oftentimes the apparently slight affections such as "growing pains" or slight sore throat have been unrecognized by the parents and are consequently untreated. We must bear in mind that the development and progress of the valvular lesion is more rapid in the child because compensating hypertrophy is more rapidly developed in children, therefore the period of failing compensation is reached earlier. There is also more demanded of the heart by way of the need of nutrition to the rapidly growing body. The heart walls are weak and less able to stand the strain imposed upon them and are consequently more easily dilated than in adult life. Anemia and malnutrition coincident with the approach of puberty are added factors that bear adversely upon the progress of an endocardial affection, as are also the frequency of attacks of acute rheumatism, chorea and tonsillitis. More marked in children than adults is also the effect of poor food and unhygienic surroundings, and I think there can be no doubt of the fact that most of the cases of endocarditis in children come from the overcrowded poorer tenement districts. A large number of these patients do well up to the time of puberty but comparatively few reach adult life. On the other hand, we have in the case of the child with a valvular affection the absence of some conditions that we are forced to combat in the adult, the



changes in the blood-vessels, the sclerotic degeneration of the endocardial membrane and the decided kidney damage we usually find in middle or late adult life. This is something in the child's favor and I believe it accounts for the frequent brilliant results in the treatment of children with apparently very bad hearts and the return of the heart to compensation or tone.

As to the treatment of chronic endocarditis. The keynote of our success is prophylaxis. That seems to be at the present day the most effective weapon at our command in all branches of medicine. I do not see how we are going to avoid a first attack of rheumatism, we may not be able to prevent subsequent attacks, but we can with proper cooperation see our cases early enough to put the patient under the best conditions for a rapid favorable termination of the acute attack and the least material damage to the heart. By cooperation, I mean that of the parents or those in whose care the child lives. They must be impressed with the insidiousness of the disease. The great tendency to relapse, the several different ways in which it is ushered in, sometimes with joint symptoms or what the parent may call growing pains, sometimes muscular twitchings, or what is thought by the mother to be simply nervousness, sometimes tonsillitis. The decided limitations as to exercise and diet or overwork at school to which most of our patients must subscribe should be drilled into the parents. To the child, when old enough, should be explained in simple language his condition and how best to guard his health. He must not be made to feel himself a hopeless invalid but to understand that he will feel better and happier if he will practise some self-denial in the direction I have indicated. It is quite common to have a mother express surprise that rheumatism can occur in such a young child. It has seemed to be quite a widespread belief that it is a disease belonging to adult life alone. This is an error we must seek to dissipate.

In medication and advice as to diet in these cases of chronic endocarditis is the hope of warding off subsequent attacks of inflammation. We will find that most of these little patients are particularly fond of meats and sugars. The nitrogenous and carbohydrate diet must be cut down decidedly. The red meats should not be allowed more than three times a week and then sparingly—sugars in like moderation. The proteids can be furnished by cereals; eggs with fish and poultry, and the nutrition not suffer. Of course, the bowels should not be allowed to



become constipated. As regards exercise, there will be more tendency on the part of the child to overindulge than otherwise and I think we may dismiss this consideration by a word of warning against too strenuous play, as in running, jumping, etc.

The activities need be less curtailed in cases where the mitral valve alone is involved, except in a considerable degree of stenosis. I think that Kerley's method of giving sodium salicylate in 5-gr. doses t. i. d. for five days out of each month with, if the case indicates, some form of iron to combat the anemia during the remainder of the time, is worth trying.

We must if possible keep the patients under observation through not only months but years. We need not see them necessarily often but if a child with a decided heart murmur is seen every two to six months, even though things are going along apparently well it will, perhaps, mean much as to the prolongation of its life.

The indiscriminate use of heart stimulants is to be regretted. Unless there is an irregular or intermittent heart action or pronounced weakness of the first and accentuation of the second sound, or the presence of cyanosis, heart stimulants are not called for. Rest in bed should be first insisted upon until it is demonstrated that stimulation of the heart is needed. Probably digitalis or strophanthus will give the best results when we are called upon to use stimulants.

To sum up: Let us be on the watch for cardiac developments in all patients of rheumatic diathesis whatever form this tendency may assume. Let us attempt to educate the parents and the patients themselves as to the common occurrence of endocarditis in children and its danger signs and demonstrate to them the benefit of prophylaxis—a rational mode of living for those who suffer from this disease.

205 WEST ONE HUNDRED AND SEVENTH STREET.

SOME OF THE PHYSICAL CONDITIONS UNDERLYING  
BACKWARDNESS, FROM THE STANDPOINT OF THE  
GENERAL PRACTITIONER.

BY

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THE physical conditions which are often times at the bottom of an apparent sluggishness of the mentality have formed the subject for so much discussion in the professional as well as in the lay press, that the subject matter which I will bring before you will have very little which is new to you but will be presented from a slightly different view point and thus enable a somewhat different interpretation of conditions with all of which you are probably well acquainted.

A great deal might be said of inheritance, especially the frequency of speech defects, of hearing, and feeble mindedness, as a result of consanguineous marriages. Far more often do we find the transmission of mental defects from the marriage of mental defectives. The natural remedy for this state of affairs is the prevention of marriages by law, and more particularly through public opinion, of individuals so afflicted. The offspring of those suffering from some form of nervous disease, be it epilepsy, intemperance, neurasthenia, diabetes, neurotic conditions or insanity, are liable to manifest nervous diseases or insanity. Eugenics prescribes the radical measure for the prevention of a repetition of these in future generations. Syphilis and tuberculosis contribute their quota of poorly developed and unhealthy bodies which might present defective tissues of almost any part of the body, a low grade of mentality being a primary factor in many, or one secondary to the lowered vitality in others. We are well aware that children of foreign parentage if their conversation is carried on in their native tongue at home are liable to be backward. So also is the social environment of the school of great consequence, but still more than these do we have to reckon with hygienic conditions in the home, which include the proper quality and quantity of food taken at the proper time, the admittance of sunshine and fresh air, the proper exercise of the individual and what is just as important, enough rest of body and mind and a sufficient number of hours of sleep.

In early childhood or even in the prenatal state the whole existence of the child might be influenced either by disease contracted by the mother during pregnancy or by an exhausted condition from excessive duties or excesses of another kind, or some deep mental impression received then, fright or disaster, or an emotional state during pregnancy. At the time of birth a prolonged labor or delivery by means of instruments might result in hemorrhages into the brain or compression of the skull with damage to nerve or brain tissue and give a subsequent history of paralysis or Jacksonian epilepsy. The infectious diseases, diphtheria, scarlet fever, measles or typhoid fever might leave damaged hearing apparatuses, hearts or kidneys in their train and cerebrospinal meningitis or inflammation of the brain might result in a thickened brain covering and a matting together of brain tissues, with its destructive effect on mentality as well as on the use of all voluntary muscles. Convulsions in early childhood with severe congestion of the brain may also lead to a bursting of the minute blood-vessels, ill supported as they are in the meningeal covering of the brain, with temporary damage or permanent destruction of certain brain areas, most often those of the speech centers and the muscles of one side of the face and the limbs of the opposite side. In infantile paralysis we have groups of muscles, particularly of the lower extremities paralyzed temporarily or permanently and in the latter case, the nutrition of the affected side being interfered with, results in the scanty growth of muscle and bone so that shortening and deformity of that side occurs. They must be helped by electricity, massage and apparatus. The cripples therefore form a class as do the blind and the mutes and come under the heading of "handicapped children" to be cared for in special classes.

Severe injury in childhood might keep the child from school for a prolonged period even though the patient might be restored to perfect health, as in chronic heart disease or kidney disease or tuberculosis of any part. Conditions of anemia and low vitality of all the tissues which these diseases entail are also of importance. Severe falls on the head might result in concussion and even in hemorrhage into the brain and should always be inquired into when we are taking the history of a backward child.

We, therefore, have quite a series of diseased conditions which might account for the lack of coordination of muscle groups be they of speech or motor expression. I admit that much of the damage is due to neglect in treating these conditions

but it makes us all the more attentive to them now that we realize that the whole life, especially from the educational side, will be severely affected if our cases are not followed up after the more acute symptoms have disappeared and backwardness results on account of physical defect.

Dealing more specifically with local lesions we can begin with the eyes and leaving blindness out of account, which as you know is due more frequently to gonorrheal infection at birth than to any other cause. There is no excuse for any child either backward or otherwise attending school without an examination of the eyes once a year at the beginning of the school term. The test of the eyes for visual defects, be it myopia, hypermetropia, strabismus or astigmatism is a simple one and can be carried out in a few moments by the reading of test cards, first for one eye and then for the other. If such defects are found parents should be notified for the purpose of consulting an ophthalmologist who will determine if glasses are required or not. Eye strain might cause an accompanying inflammation of the lids which can be recognized as a redness of the lining membrane when the lids are everted. The slight granulation found in this condition must be differentiated from the granulations in trachoma, which are of a different and more serious nature. The inflammation of the lids might cause a sensitiveness to glaring light which would influence the child's vision. Each child in a class room should be questioned to ascertain if the writing on the blackboard is readily apparent and if necessary the child's seat should be changed to remedy this defect. Often times chronic inflammation of the lids is the direct result of excessive intake of sugar or rich foods, and this must be considered in taking children's histories to get at the root of the evil.

Defective hearing is one of the most important sources of backwardness and one which is more rarely detected than defective vision. Here systematic examination of children must be made at least once a year. Obstructions in the nose, excessive adenoid or lymphoid tissue in the nasopharynx, the extension of nose or throat colds into the Eustachian tube, especially in influenza, measles or scarlet fever; inflammation of the middle ear, simple or purulent, with or without perforations; or meningitis involving the hearing centers, or hereditary predispositions involving the nerve of hearing, might all be at the bottom of defects in hearing, the wide range of diseased conditions making this affection so common. Here particularly, neglect in treating



a simple diseased state often results in severe and permanent impairment. A child may miss not only a great deal which is spoken by his teachers, and the recitation of pupils, thereby missing much of the intellectual exercises which are intended for him but also exact enunciation as given by the teacher which might result in defective speech. Children thus affected should invariably be placed in front seats or where they can hear to the best advantage. Excessive adenoid or lymphoid development in the nasopharynx, besides interfering with the proper aeration and drainage of the middle ear through the Eustachian tube, oftentimes presses against the soft palate causing defects in speech; but the point I would like to bring forth in this connection is that adenoid tissue is a resultant rather than a cause, due to the lack of nasal breathing. If nasal breathing is persisted in, the air pressure within the nose is sufficient to broaden out the interior and to press down the hard palate which will in turn permit the teeth to take their proper places without crowding. The pressure also supports the nasal membrane with its liberal meshwork of blood-vessels and the blood-vessels of the naso pharynx in the adenoid tissue normally present there. In other words it prevents the excessive blood supply of the part which is the cause of prolific growth of adenoid tissue. Disturbance of the circulation in the nose and nasopharynx results in the disturbance of the circulation at the base of the brain. Is it a wonder then that the mentality of mouth breathers is often times markedly influenced? Nasal breathing means air inhaled into the lungs in a warm moist and filtered state. To overcome the resistance of the comparatively small opening of the nostrils the chest is compelled to expand, thus distending the lungs to their utmost and causing an inrush of blood to bathe the lungs, resulting in a greater exchange of oxygen and carbonic acid gas and thus giving greater degree of healthfulness to the entire system. In the mouth breather the palate has not been pressed down but remains vaulted and narrow. The teeth are, therefore, crowded and come forth irregularly. The tonsils from the constant irritation of dust inhaled become enlarged and often times infected. Very little resistance is offered when the air is breathed through the mouth; the lungs, therefore, are not expanded and the chest remains contracted. Is it a wonder then that children so affected are puny and anemic?

The most common defects of speech are due to either tongue

tie or the superabundance of adenoid or lymphoid tissue or enlarged tonsils; also to a disturbance to the innervation of speech due to the lack of training in the proper use of and coordination of muscles, especially of the tongue and lips, further to the paralysis of the speech muscles following diphtheria or meningitis; or to an insufficient air pressure. Regarding the latter I refer to the improper and insufficient amount of air taken into the lungs, and the insufficient use of the muscles which contract the chest, forcing out a column of air to make speech audible.

We now come to the derangements of the gastrointestinal tract, many of which date back to infancy and result in a train of symptoms which are often times the underlying causes of backwardness. A child may have a severe attack of inflammation of the large or small intestine during the first year of his life which ever after will result in susceptibility to irritating foods with frequent upsets and malassimilation. Anemia, an undertoned condition of the muscular and ligamentous system, and most important of all, acute or chronic autointoxication are the result. By autointoxication ordinary food, as meats, vegetables or fruits, especially those more difficult of digestion, undergo putrefactive changes due to germs contained in the intestines. The poisons thus resulting are absorbed into the general blood current and act upon the brain, making the mentality sluggish. They have the same effect as fatigue poisons giving the feeling of languor and exhaustion and even sleepiness and coma.

Of late years considerable attention has been given to the condition of the teeth in school children and rightly so, because decayed teeth mean the harboring of myriads of pathogenic bacteria, which when constantly swallowed, infect the contents of the gastrointestinal tract, producing toxic material which has a deleterious effect on all the body tissues, these bacteria are not killed by the hydrochloric acid of the stomach.

Decayed teeth often mean painful teeth and repeated or continuous pain means undermining of the nervous system. The third factor is the improper mastication of food on account of the loss of decayed teeth or their sensitiveness, if present. Improperly masticated food causes difficulty for the gastric secretions to digest it. And the lack of salivary juices means the failure of the early conversion of carbohydrates and a dimin-

ished stimulation of the gastric juices, which are partly dependent on this sort of stimulation. The saliva is alkaline in reaction and brings forth the excretion of hydrochloric acid in the stomach, which in turn is essential for the proper action of the pepsin. Besides the effect on a sensitive stomach or intestine by the malassimilation of food and the production of poisons, the general nervous system is profoundly influenced. This becomes very apparent in chronic inflammations of the appendix. The innervation of the appendix is most intimately connected with the innervation of the intestines and the irritability of the former is quickly reflected upon the latter. Patients who for years have been troubled with recurrent disturbances of the appendix and who have led a more or less miserable existence are usually so greatly benefited by the excision of the diseased organ that it is difficult for them to realize that the removal of so slight an organ can result in so beneficial a change throughout their whole organism. Constipation frequently means absorption of poisonous products from the retained matter in the large intestine. Besides the headaches which often times result, sluggish mentality is also complained of. The disturbances of the liver frequently brought about by excesses of sweets, meats, eggs, or acid foods result in bilious attacks, accompanied by headaches, nausea or vomiting and the irritation of delicate membranes lining joints, nerve trunks and the mucous membrane of the eye, nose, and throat. In every chronic inflammation of the conjunctiva, I invariably inquire into the child's diet and find that sugar, yolk of egg or cream are taken to excess. I always advise moderation in these articles of food in such cases. The above causes also account for irritability in children as well as in adults. With many children eggs taken more than once or twice a week is often times the only thing at the bottom of their irritability.

With the brain in the least receptive condition to absorb and retain knowledge, anemia, as recognized by the pallor of patient's lips and conjunctiva, is an important feature in backwardness. Anemia means a deficiency of hemoglobin, the coloring matter of the blood, or a diminution of the number of red corpuscles. The hemoglobin is bound up in the red corpuscles and is that to which the oxygen is united when taken up by the lungs. Less oxygen throughout the body tissues means a lowered function of those tissues and the brain is affected in common with all those tissues. Anemia therefore means lowered recep-



tivity and lowered retentiveness of the mental faculties. Fleishl's hemomometer is the instrument by which we can determine the more exact degrees of anemia.

The possibility of masturbation on the part of the girl as well as boy pupil must be borne in mind by the teacher of backward children and corrective measures instituted, by parent, teacher and physician. The removal of a local condition which draws attention to the parts, usually a phimosis in boys, the use of cold baths and tonics for building up the nervous system; heart to heart talks on the deleteriousness of the habit, and proper diversion with plenty of exercise and fresh air, will stop a habit which might be a terrific drain on the mind and nervous system in general.

There is still a very broad but obscure field opening itself to us regarding the internal secretory glands particularly the thyroid and the adrenals. That there is a very intimate connection between the deficient or excessive secretory functions of these glands is very apparent in cretins, but to what extent remedial effects can be obtained with the administration of the one or the other of these glands in ordinary backward children have not as yet been sufficiently determined. This opens a wide field for the school physician and psychiatrists and will undoubtedly be of greatest value in special cases. At the Ethical Culture School, New York, of which I am the Medical Adviser, we will have outdoor classes for several grades and to these I have admitted four varieties of pupils, *i.e.*, nervous, anemic, those suffering with enlarged glands and the mentally backward. Of all these the last will interest me most as the experiment proceeds, as it will determine to what extent openness, fresh air, and sunshine will stimulate sluggish mentality where no physical condition can be determined as a causative factor. That the mentality of the other groups will be markedly affected by their improved physical condition goes without saying.

In conclusion, I will state, therefore, that sociologists and psychologists have their very important functions to perform in connection with the teacher but far more intimately than these must be the relation of the physician to the instruction of backward children, not only to recognize but to treat and eradicate the numerous physical conditions which underly backwardness and moral delinquency.



## MEETING OF THE AMERICAN MEDICAL ASSOCIATION AT ATLANTIC CITY.

(Continued.)

*Intestinal Toxemia in the New-Born.*—In this paper DR. JOHN LOVETT MORSE of Boston presented the picture of a baby, normal at birth, which became suddenly ill on the second, third or fourth day, becoming unduly quiet, or showing marked symptoms of nervous irritation, with tendency to constipation. Temperature moderate. Meconium had not been passed. Symptoms probably due to toxic absorption from the intestine as the result of a bacterial infection of the meconium occurring soon after birth. He cited several cases from his practice, presenting almost uniform symptoms, which so simulated other diseases of infancy that the differential diagnosis was difficult. He gave a thorough cleaning out, with soap suds enema, stopped all food until the next day; and from that time on the child was apparently normal. He believed that breast milk was the best food after treatment or, lacking that, modified cows' milk.

DR. ENGLISH of Summit, N. J., wished to know if Dr. Morse had ever used calomel in place of castor oil. He had given 6 grains of calomel to a patient one time, through an error, with no untoward results. He was called hastily as soon as the mistake was discovered and expected to find a moribund infant when, to his surprise, it was markedly improved and in a day or two entirely well. He said that he had never had the temerity to prescribe such a dose, but it had worked in that case.

DR. GOODMAN of New York said that these cases were distinct clinical entities upon which a great deal of clinical and laboratory research work had been done. The French physicians had extracted a watery extract from the stool, injected it into a guinea-pig and the pig died. After the condition had improved, as it did in the majority of cases by cleaning out the bowel, the watery extract was again injected with no harmful results to the guinea-pig. The same series of experiments had been done with lumbar puncture. He thought that the condition was especially hard to diagnose differentially in older children. He had a case which looked so much like a case of meningitis that it was thought to be tubercular. Examination of the spinal fluid, however, was absolutely negative, and injected into a guinea-pig showed no results. After the institution of aseptic measures the child recovered.

DR. LOWENBURG of Philadelphia said that the clinical picture presented called to his mind many cases which he had been unable

to diagnose, but had looked upon as infections from the bronchi. He had thought them to be so-called simple pneumonia, and wished to know if the doctor had ever considered his cases from that viewpoint.

DR. COOLEY of Detroit thought that he had been able to trace cases presenting the clinical picture outlined to more than one bacteriological causative factor. In two there were a large number of pneumococci present. In others he was able to find no definite pulmonary organism. Other cases still, presenting apparently the same symptoms, seemed to be due to starvation, while others were heat prostration. He said that from his experience all recovered on practically the same treatment—starvation for one day and thorough cleaning out of the alimentary canal.

DR. CHURCHILL of Chicago thought that his cases did not present such a clean train of symptoms. He always considered the possibility of pneumonia and in many had found a high leucocytosis. Many had developed into clearly defined pneumonias.

DR. SCOTT of New York thought that there was undoubtedly a chemical combination between the sugar and the proteid in the mother's milk, and bacteriological invasion of the nipple. He said that when one realized that the patient was a child whose anatomy was just being established, and that the intestines absorbed very quickly, it was not difficult to see how easily just such symptoms as these cases presented could be brought about, and if they were set up it would be very soon after birth.

DR. HART of Brooklyn said that he had had to deliver a child on account of the serious toxic condition of the mother and repeated convulsions and after delivery the child developed a slight twitching on the right side, which gradually passed over to the other side. The pupils were equal and the knees flexed equally. After two or three days during which the condition grew a little more pronounced, he thought possibly the child had a hemorrhage, but before operation (which had been advised) he thought best to try catheterizing. The results was slight, but irrigation was instituted and the twitching and convulsions ceased, practically. After a week the child was taken from the hospital apparently cured. About six months later it was brought back with a stiffening on the right side of the body and every appearance of an imbecilic infant.

DR. McCLANAHAN of Omaha thought that where the condition was recognized early the prognosis was absolutely good.

DR. MORSE (closing the discussion) said that he preferred to use castor oil as a laxative because it worked more easily and quickly. He said that he too had seen many cases with pneumococcus and other infections which presented practically the same train of symptoms, but he had not included them in this paper because he thought the possibility of confusing them with the class of cases he had in mind was slight. He did not remember that any of his cases presented a skin infection.

*Pellagra in Children.*—DR. J. ROSS SNYDER of Birmingham,

Ala., presented a preliminary report showing that while the disorder did appear in young children, it was more common between the second and the fifteenth year. He said that while it was most common in rural districts and among the poor, the city child and the child of wealthy parents was by no means immune. He thought that aside from the skin affection the children seemed normal for a long time after the onset of the disease, playing as usual.

DR. BUTTERWORTH (New Orleans) said that Bass of New Orleans had fed chickens with spoiled cornmeal and produced incontrovertible symptoms of pellagra, so that he thought the theory of spoiled corn as an etiologic factor still merited serious consideration. He said that the bowel troubles were the first symptoms to present; then the intestinal disturbance; next the skin affections; and lastly, and most serious, the nervous symptoms.

#### SECOND DAY.

##### *Morning Session, June 5.*

*Use of Polycarbohydrates in the Diet of the Young Infant.*—Read by DR. JULES M. BRADY, St. Louis. After enumerating the varieties of modified foods used in infant feeding he said that the object of his paper was to show the favorable results obtained from furnishing the infant, in the first three months of life, the carbohydrate-content of its milk mixture in the form of maltose, dextrin, cane-sugar, lactose and barley, in lieu of the usual 7 per cent. lactose. He said that the usual milk modifications used in private practice did not succeed in asylums. He began institution infants on a fat-free diet at birth, assisting with a percentage of carbohydrates, and gradually increasing. He said that while the individual infant would always furnish the data necessary to modify milk to suit its needs, still some point of departure could be reached from a study of the varieties given. Over a period of ten months he had made records of 170 babies, ninety of whom received breast milk for the first two weeks, then a mixture, forty-five a modified milk from birth, and the rest a mixture after the second or third month. He said that in all the series which received the modification according to his formula there was a remarkable freedom from disturbance of the intestinal tract and alimentary canal. The mortality was 10.5 and of that number but six died of decomposition. His cases were under observation at least six months—some longer, and in that time they had had no cases of rickets present. He said that he could not see any relation between rickets and the giving of starch, because the normal infant was able to take care of some starch and needed it. He thought that where the asylum infant did not make a satisfactory gain on a mixture of milk, lactose and water, it could be assisted during the early weeks by liberal use of carbohydrates. He thought a successful dietary



must include a liberal amount of carbohydrates which would assist the infant materially in combating the depressing influences of institutional life.

*Clinical Notes from the Willard Parker Hospital, New York; Intestinal Intoxication.*—DR. LOUIS FISCHER of New York read this paper showing that recent research into infantile metabolism had proven many new facts and that the study of internal secretions necessary to the assimilation of food had led to a determination of its digestibility. He said that artificial feeding was gradually reaching perfection; as knowledge became more classified the rôle of bacteria was given less significance, and fat, sugar and casein given more attention. He thought that sugar was a factor which should be given careful attention, as its misuse gave rise to severe disturbance and fever. Maltose he thought more easily absorbed, and less irritating to young infants, than milk sugar. He said that digestion was frequently interfered with by excessive quantities of sugar and where there was severe metabolic disturbance with loss of weight there was no sugar the equal of maltose. He emphasized particularly the point that no food should be allowed to stagnate in the intestines and that in febrile conditions casein curds could be prescribed with marked lessening of putrefaction and modification of the intestinal intoxication.

*A Series of Infants Fed on a High-Percentage Albumin Milk.*—DR. FRANK C. NEFF of Kansas City, Missouri, gave lantern-slide illustrations of sixteen weight charts to show the results of feeding what he termed "high-percentage albumin milk." In his formula the element of whey had been increased and whole buttermilk used as a diluent in place of half buttermilk and half water, as is usually prescribed. His formula was practically Finkelstein's eiweiss-milch in which all the percentages (to a greater degree the proteids) were increased. In the series presented all the infants were under six months old, ranging from twenty-two days to five and one-half months. None had gained on breast milk, but gained steadily from the time they were put upon his modification. Many cases showed a gain on the high per cent. albumin milk both before and after the addition of sugar. He could not offer any explanation of why high buttermilk was tolerated, but thought probably it increased the digestibility of the milk so that the child got a higher caloric value. Nine of the sixteen cases reported showed good gains, two only a slight gain, two a loss, and one case was almost atrophic. Three remained constipated. As long as they continued to gain they were kept on this food.

*Ileocolitis with Meningeal Symptoms* by A. L. GOODMAN of New York. He said that any form of enteritis might give rise to cerebral symptoms, and that the scope of temperature variations would be governed by the course of the meningitis. He believed that gastrointestinal autotoxemia might give rise to symptoms which could be mistaken for meningitis and that in case of doubt



lumbar puncture would assist in making a differential diagnosis. He said that all of the microbes found in pathological conditions might accidentally be found in a normal stool, and the causative factor of the colon bacilli being still a matter for conjecture, he did not believe that examination of the stool alone could give much information. He reported cases giving careful laboratory findings showing that even transitory digestive disturbance might be accompanied by severe nervous symptoms, but animal inoculation would prove them to be negative. In conclusion he said that the diagnosis of meningeal symptoms might be extremely difficult, requiring close laboratory examination; that it could not always be based upon the abruptness of the onset. That irregularity and inequality of the pupils and respiration, often regarded as classic symptoms of meningitis, had been found in ileocolitis. That the diagnosis could be established upon the examination for toxicity, indicanuria and aciduria. The prognosis he considered favorable with early recognition and removal of the cause. His treatment consisted of purgatives, regulated diet and reduction of the digestive disturbance. He said that as yet no attempt at isolation of the injurious toxin had been successful.

DR. ZAHORSKY (St. Louis) discussing Dr. Brady's paper said that he had observed that since so much attention had been paid to the diet of asylum infants the mortality was steadily coming down, until in their institution it was less than 10 per cent.—the lowest he had been able to find on record for any asylum—and all deaths were among the bottle-fed infants. He said that although they had not used the carbohydrate modification mentioned he considered it excellent. They used half top-milk with additional sugar. He said that they knew that even very young babies did digest fat and had found that when they were fed fats they did unusually well. He lamented that in modified foods fat was being eliminated and thought that it had been demonstrated that at the end of six months the death rate was no lower by reason of the elimination of fats. He thought before changes in food formulæ were made comparative tests should be made in the results.

DR. WEEMS of Columbia, Texas, was interested in Dr. Goodman's paper because he had had cases where he could not make the differential diagnosis and the parents would not consent to lumbar puncture.

DR. DOUGLAS of Detroit wished to know what was implied in the term "maltose." He thought it a confusing word used unqualifiedly.

DR. HESS of Chicago agreed with Dr. Fischer that catharsis was a material aid in elimination from the bowel and from the kidney, but cautioned against going too far. He had never had a case in which he felt justified in giving 5 grains of calomel to a young child. He cited Dr. Abt's series of cases at the Michael Ries Hospital where 1 grain of calomel given in divided doses over

a period of three days produced at least microscopic blood in the stool, as did also magnesium sulphate or 1 gram of castor oil given in the same way over a like period. And he said that some of these were normal infants, who happened to be in the hospital because the mother was confined there. He thought that the reason more uniformly good results were not secured from the use of eiweiss milk was because it was not properly prepared. He said that since Finkelstein had issued more comprehensive directions for its preparation he had been able to get very good results.

DR. MORSE of Boston thought that the etiology of diseases of the gastrointestinal tract and their classification was in a transitory state. He said that while the Germans laid a little too much stress upon the chemical side the Americans probably paid too much attention to the bacteriological, and he thought that the truth probably lay somewhere between. He said that any baby, from birth up, was able to digest a certain amount of starch and should have it. He considered lactose the best sugar for the normal infant, although milk sugar might start fermentation in the intestinal tract. Where such fermentation did set up he said that it could be promptly relieved by cutting down the sugar to a minimum and feeding a high proteid diet. His experience seemed to prove that very few infants would not improve by the substitution of maltose in place of dextrose. He said that before giving maltose one must remember the chemistry and bacteriology of the intestinal tract. He thought that lactose was of distinct advantage sometimes on account of its slow absorption, while in other cases maltose was preferable for just the opposite reason. He said that some formulæ inconsistently called for the taking out of the lactose (as in eiweiss milk) and then the addition of buttermilk. He said that in the routine use of eiweiss milk the bacteriological element in intestinal diseases was lost sight of. Discussing Dr. Goodman's paper, he said that he had had cases of meningism in which there was an increase in the mononuclear cells which led him to suspect tubercular meningitis.

DR. ROYSTER of Norfolk, Va., thought that in discussing diseases of infancy it was necessary to differentiate between the institution case and the case in private practice. He said that in asylums the most potent contributing factors to high mortality were insufficient help and want of fresh air. He said that frequently ten bottle babies were under the care of one nurse, so that they could not possibly have individual care. In the institution with which he was connected they had one graduate nurse, one student, and two ward helpers and to this he attributed their reduced mortality. He had used the high-percentage albumen diet during the past winter with interesting results. Two babies did well for a time and then began to go down; he substituted dextrose malt milk and in one week one gained seven ounces and the other five or six. No other change was

made in the food and they continued to do well. After that he took a series using proprietary food, said to be especially rich in malt sugar, with some cases, milk sugar with others and dextrose malt sugar with the others. In the first instance the gain was 3 ounces, in the second five to six, and the last one. He did not advise keeping a child on any one food indefinitely, believing that appearance of the least digestive disturbance indicates the need for change.

DR. SCHWARTZ of New York thought his best results were obtained with malt soup. He said that chronic intestinal disturbance yielded better to it than to ordinary additions of maltose and that it reduced the fatty acids to an appreciable extent. He said that malt sugar was never claimed to be good for normal children, but there was nothing better for the under-developed child. He thought that the good results from eiweiss milk were to be attributed to its high protein percentage and low proportion of other ingredients. He thought that the most important discovery in the last ten years had been the good results from combinations, reducing the amount of sugar and increasing the fats, and *vice versa*. He said that where there was temperature and intestinal disturbance starch should be eliminated until the temperature was normal.

DR. SOUTHWORTH of New York thought that cereal diluents were indicated in intestinal disturbance. He said that the use of starch was a protection to the child because it aided in the splitting of the fats and the sugars and protected against the fatty acids. He thought that dextrin formed practically the same sort of a protection and said that where one wanted part of the sugar as maltose and part as dextrose it could be slowly split off in the intestines and furnish further maltose during the time of its absorption. He said that a dry preparation gave 40 to 60 per cent. dextrine and the thick fluid about 50.

DR. LOWENBURG (St. Louis) said that for the past eleven years he had been feeding top-mixture and cane sugar and had had such excellent results that he saw no indications for a change. During the summer months he pasteurized. He thought that a combination of the chemical and bacteriological etiology of disorders of the digestive tract would give a proper understanding of them. He thought that sugar was not contraindicated because human milk contained a high percentage of it.

DR. DENNETT of New York thought that the matter of boiling milk deserved mention and said that this probably accounted for some of the good results from malt soup.

DR. FISCHER (in closing) said that the dosage of calomel recommended was not intended for infants. He referred to children from six to twelve years of age with scarlet fever. He admitted that calomel might do harm and in some cases he did not use it, substituting 4 drams of Rochelle salts where there was tendency to constipation, but intended to impress the necessity for free elimination to shorten the course of the disease.



DR. JOHNSTON of Grand Rapids said that eiweiss milch was only for sick babies and should seldom be given for more than six weeks. He said that in the Grand Rapids asylum the mortality was 10.8 in infants under one year of age.

DR. BRADY in closing the discussion of his paper said that overcrowding, insufficient help, lack of fresh air and many other things contributed to raising the death rate in asylums. He thought that their recent practice of maintaining a temperature of 75 degrees instead of 68 as usually recommended kept babies comfortable and had helped to lower the mortality. He said that they had repeatedly tried to feed top-milk but found that their best results were from a small percentage of fats augmented with carbohydrates. They were able to feed one modification, containing thirteen calories to new babies in 4-ounce quantities without vomiting. He emphasized the fact that if the caloric requirements were watched and met there would be no trouble. He recommended seven feedings for twenty-four hours and then as the fat percentages were increased cut it down to five. He thought that the use of a hair sieve in making eiweiss milk, in place of the wire sometimes used, would divide the curd more finely, producing better results. He recommended the addition of flour early so that less of the maltose and dextrose preparations would be needed. His experience had been that babies under three months did not thrive on malt soup, but that they would tolerate maltose as early as the third week.

DR. NEFF said, in closing, that Dr. Hess' cases would probably have gained if sugar had been added to the formula. Analysis showed that the amount of sugar normally contained in milk varied greatly, so that may account for some of the varying results from giving milk. He said that the variety of conditions in the cases presented called for so large an assortment of formulæ to meet them that he presented this one for trial in cases which had not gained on any of the well-known modifications.

*The Menace to the Young Child of the Common Infectious Cold* read by DR. THOMAS S. SOUTHWORTH of New York. He said that such colds, systemic in character, were capable of doing much damage to infants and young children, causing among other things otitis, pneumonia, sinus infection and interference with nutrition in both private and hospital practice. Unadvised increase in food by the mother caused complications in the symptoms, and allowing the infant or young child to come into close contact with other members of the family suffering from infectious colds often laid the foundation for serious illness. He thought that the loose terminology employed disguised the seriousness of the condition and that unless it was impressed upon parents, so that they would appreciate the dangers involved in taking their children into public places and allowing them to be handled by strangers who happened to come into the house, it would continue to menace the health of young children.



DR. ENGLISH of Summit, N. J., thought that quite a number of such cases were due to infection by the bacillus influenza and that others presented prostration. In those dependent upon lung prostration he advised iron, sodium and caffeine benzoate (the formula prepared by Merck) in moderate doses every four hours.

DR. ZAHORSKY of St. Louis thought that this was next in importance to nutritive disorders. He said that all acute diseases of the respiratory tract were due to a germ communicated from one person to another. He thought that the word "gripp" better described the condition and that it should be employed until one that would impress the seriousness of the infection upon the mind of the laity could be substituted.

DR. MCCLANAHAN of Omaha. During the past two years he had made a series of eleven cases, five of which had no etiological factor but a common cold and all developed nephritis. He instructed nursing mothers to be extremely careful not to breathe over the child and during the most vicious stage of her attack to wear a mask or cover her face with a handkerchief while nursing the child.

DR. SCOTT of New York thought that the cold itself was not as deserving of attention as the fact that it prepared a field for the invasion of other and more pernicious bacteria which were always present.

DR. MCKEE of San Francisco said that in his practice he treated the well children in a family where there were one or more infectious colds giving them hexamethylenamine and benzoate of soda. In tuberculous hospitals, he said, when there was a case of infectious cold a vaccine was prepared from the discharge and each of the inmates immunized.

DR. KERR of Brooklyn said that infectious colds in themselves were not especially dangerous, but in healthy individuals there were bacteria always ready to set up active disease conditions and the infection from a cold prepared a fertile field for them. He deplored the practice of housing the child upon the first appearance of coryza. He thought that if the child was given plenty of fresh air it would recover quickly and he did not believe that the temperature of the air was of importance because it would be modified to body temperature by the time it reached the lungs.

DR. SEDGWICK of Minneapolis said that he was in favor of any term to designate this condition which would more impress upon the minds of the laity its gravity than did the simple word "cold."

*The Properties, Uses and Indications of the Various Carbohydrates in Infant Feeding* read by DR. HENRY DWIGHT CHAPIN of New York. He said that the term applied to a chemical combination of carbon and water. That they had a common function in nutrition which was to supply carbon that liberated energy and heat when oxidized. Five forms of carbohydrates, he said, were used in infant feeding—starches, dextrins, maltose, saccha-

rose and lactose. Some of these forms required cooking and predigestion to be assimilated; others could be taken directly into the blood and utilized. He thought that the form to be employed depended upon the infant but it should be borne in mind that 40 per cent. of the caloric value of a feeding was spent in its digestion.

DR. DOUGLAS of Detroit said that his experience had been that children would digest so much curd irrespective of the addition of carbohydrates. He permitted the use of solid starch just as soon as the child would take it.

DR. GRIFFITH of Philadelphia thought it impossible to say that any one formula of modified milk would feed all healthy babies.

DR. CHAPIN closed the discussion with the remark that he did not recommend this as the only food to be used, or that these sugars should take the place of milk sugar, but in view of the large number of conditions presenting, the pediatricist must have at hand many modifications to meet them, hence his presentation of this one for a certain class of cases where it was indicated.

*(To be continued.)*

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## REVIEWS.

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BABY'S TEETH TO THE TWELFTH YEAR. BY ALBERT WESTLAKE, D. D. S., Mitchell Kennerly, New York and London, 1912.

It is only within the past few years that the care and preservation of the teeth have received the attention merited by the importance of the subject. The statistics recently obtained from the schools of New York, Brooklyn and Boston showed an astonishing frequency of dental caries and malformations and demonstrate the importance of teaching parents the great necessity of preventive and early curative measures. It is in line with this movement that Dr. Westlake has written this little book of 35 pages.

It outlining the preventive measures, Dr. Westlake begins with the unborn child and he believes that a well balanced diet for the expectant mother is important to insure proper development of the fetal teeth.

The advice contained in Dr. Westlake's book is, as a rule, good and there are a great number of suggestions which should prove of value. The book contains a number of statements, however, with which many physicians will not agree, particularly in reference to the role of autointoxication in human pathology. In spite of these defects, which are unimportant, the book as a whole is commendable and merits a perusal by every mother.

It is to be sincerely regretted that the author has given directions for feeding infants. The information is too meager to be of the least possible service (occupying only three pages) and its accuracy in parts is to say the least, questionable.

**OUR BABY. A CONCISE AND PRACTICAL GUIDE FOR THE USE OF MOTHERS IN THE CARE AND FEEDING OF INFANTS AND YOUNG CHILDREN.** BY RALPH OAKLEY CLOCK, PH. B., M. S., M. D. Assistant Physician to the Out-patient Department of the Babies' Hospital of the City of New York and St. Mary's Free Hospital for Children, New York City. Clinical Assistant Obstetrician to the New York Post-Graduate Medical School and Hospital; Lecturer on Child Hygiene to the Women's Educational Club of Pelham, New York; Fellow of the New York Academy of Medicine; Member of the American Public Health Association; etc. D. Appleton and Co., 1912.

In common with a number of volumes which have appeared during the past few years, the object of Dr. Clock's book is to educate mothers in matters relating to the hygiene of infants and young children.

The usual topics have been considered such as baths, clothes, sleep, food, etc. The directions are all explicit and the advice excellent. Although the book has no claim to originality, yet all of the important topics usually contained in books of this type have been covered in a very satisfactory manner. Worthy of special commendation are the facts that the author does not give directions for the treatment of disease nor does he give formulas for artificial feeding.

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## BRIEF OF CURRENT LITERATURE.

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### DISEASES OF CHILDREN.

**Arthrodesis of Some of the Smaller Joints in the Treatment of Paralytic and Acquired Deformities.**—R. E. Soule (*Jour. A. M. A.*, 1912, lviii, 1440) has found arthrodesis of service in correction of certain deformities arising from infantile paralysis, hammer-toe, flat-foot and wrist-drop. In doing an arthrodesis, the operator should be sure that the deformity is a permanent one, not due to temporarily paralyzed muscles or to muscle overstrain or tire. The patient should be old enough—not under eight. All resistance to correcting the deformity should be previously overcome. The operator should strive to cause as little mutilation of the contiguous bones as possible. He should not use a curet. The exaggerated idea of removing a V-shaped piece of bone is overemphasized. Success depends on ability to make a flush joint, as a carpenter would say, and thereby correct the deformity, and also depends on ability to apply a fixing dressing which allows of the least separation of the opposed denuded bony surfaces.

**Cardiac Irregularities in Childhood.**—H. H. Turnbull (*Australian Med. Jour.*, Apr. 20, 1912, 444) says that the appearance of extrasystoles, single or multiple, in the child, whose heart



normally fails to show them, strongly suggests that at the spot from which the beats arise there is an area of myocardial change; and therefore the child should be closely watched and its progress followed with especial care until the extrasystoles disappear, as they seem to do in a week or a few weeks, or until it is certain that the heart can perform satisfactorily the work allotted to it. If the irritability increases and the heart fails to gain strength for its proper work, active progressive myocardial involvement is probably present, and the prognosis is serious.

**Differences Between the Surgery of Children and Adults.—**

C. N. Dowd (*Surg. Gyn. Obst.*, 1912, xiv, 353) states that children under two years of age do not often have tuberculous disease of the neck lymphatics; when they do have it, they usually show less resistance than older children do. Between the ages of two and seventeen years, tuberculous lymphatic disease in the neck is fairly regular in its course. This is the period where the upper nodes usually break down before the lower nodes are extensively involved. In adult life the breaking down of the upper nodes is not so likely to occur; the infection spreads downward and involves the lower nodes, thus presenting a clinical picture and a problem different from that in children. The writer has studied 204 cases of empyema. Among twenty autopsies on these cases, thirteen had pneumonia; five, pneumococcus peritonitis; one, pneumococcus meningitis; four, pericarditis; three, tuberculosis; five, contracted lung. These autopsy findings indicate how great is the error of believing suppurative pleurisy to be the important element. The patients were suffering from pneumonia, peritonitis, pericarditis, meningitis, and tuberculosis. It is manifestly wrong to pursue such patients too vigorously with aspirating needles or to etherize them and search for visionary pockets of pus. In this group of cases one notices the preponderance of pneumococcus inflammations. The reports of pus examinations, so far as they are available, indicate that pneumococci were found in fifty-two instances, streptococci were found in six instances, no bacteria were found in nine instances. This study indicates that children are more apt than adults to have the form of tuberculous peritonitis which spreads insidiously so as to involve a very large part of the peritoneum, and which does not give a large percentage of localized inflammations. There are two conditions in which operation seems particularly desirable: The early form in which there is much ascites. The form in which there is a lesion so localized that a definite focus of maximum infection can be removed.

**Obstetrical Consultations for Infants.—**E. Bonnaire (*Presse méd.*, May 11, 1912) denominates "obstetrical consultations for infants" the work which may be done in connection with every obstetrical clinic in teaching the nursing mother how to supplement an insufficient supply of milk with artificial feeding with cow's milk, or how to improve her general condition so that the supply of milk will be better in quality and quantity. Many



mothers are unable or unwilling to nurse their infants. Among the working classes this occurs often from necessity, the mother being the bread-winner and forced to go to work daily. She puts her infant in a day nursery and leaves it there during the day, and soon loses the ability to nurse it at all, or gives it up on account of the inconvenience she experiences in not being able to nurse the child during working hours. The obstetrician is able to teach the mother the value of even a small quantity of mother's milk to supplement artificial feeding. This breast milk in small quantity acts as a ferment to assist digestion of the cow's milk. As soon as the mother gives up nursing altogether the child comes under the supervision of the pediatricist. But it is the privilege of the obstetrician to assist materially in the prevention of infant mortality if he can hold and influence these working mothers and induce them to nurse their infants for even a few hours in the day. Pinard has attacked the problem of congenital debility, and says "mother's milk is the right of the infant." Budin says "the best milk is that which the child finds at its mother's breast." If Sunday morning is devoted to such consultations it will much assist the working mother, since she cannot afford to forego her wages while spending her time awaiting the consulting doctor during the week. It is the midwife and the obstetrician who must be instructed in this work, and who must take it up, since it is they who come in contact with the mother at the time of the birth of her child, and who by judicious management can maintain their influence over her for some time, by dwelling on the value of their counsels to the health of her child. A propaganda in favor of nursing of every infant by its own mother can be carried out in connection with every obstetric clinic, and by every physician in his private practice and it is our duty as physicians to see that this is done if we wish to do our utmost to assist in the reduction of infant mortality.

**Embolie Gangrene of a Leg Consecutive to Malignant Diphtheria.**—Aviragnet, Blechmann, and Huber (*Ann. de méd. et chir. inf.*, May 15, 1912) give the history of a child who was recovering from malignant diphtheria when he suddenly had an intense pain in the abdomen, accompanied with paleness, cyanosis, and bluish spots on the legs. After some hours these cleared up on the right side, but the left leg remained permanently exsanguinated. Fortunately for the child death closed the scene before gangrene set in. Embolism of the lungs is not very uncommon after malignant diphtheria, but in the legs it is rather rare. There are three groups of such cases; first those in which gangrene comes on and removes the limb; a second in which the circulation is reestablished after a few days; and a third in which death ensues, as in the recorded case. The increased appearance of these accidents depends on the use of antitoxin for the last few years, which has prolonged the life of these little patients.

**The Mongolian Blue Spot.**—J. Anderodias (*Rev. mens. de gyn.*

*d' obst. et de ped.*, May, 1912) mentions a peculiar blue spot on the lumbosacral region, which is characteristic of the Mongolian races, and is rarely seen in the Caucasian and never in the negro. It is due to pigment placed in an unusual situation in the skin. It is found in the deepest layers of the derma, while the normal pigment is placed in the epidermis. According to some this spot appears only in children who have a mixture of Mongolian blood.

**Case of Allergy to Common Foods.**—The idiosyncrasy of certain individuals to common foods has been recognized for many years, but the essential causes of the condition have remained obscure. O. M. Schloss (*Amer. Jour. Dis. Child.*, 1912, iii, 341) presents an interesting study of a boy eight years old in whom marked urticarial lesions were caused by the ingestion of eggs, almonds and oatmeal. The idiosyncrasy to egg was not congenital but was acquired at some time between the ages of ten days and fourteen months. Symptoms due to the ingestion of oats appeared some time after the child had first eaten oatmeal when he was twenty-two months old. As far as can be ascertained, the idiosyncrasy to almonds was manifested the first time this food was eaten. It was found that cutaneous inoculation of these and certain related food substances produced an urticarial wheal at the site of inoculation. The cutaneous reaction was produced only by the protein constituents of eggs, almonds and oats. Different proteins from the same source varied in activity, some being incapable of causing a reaction. Some of the active proteins caused urticaria by mere contact with the unbroken skin. It was possible passively to sensitize guinea-pigs to ovomucoid (one of the active proteins from eggs) by intraperitoneal injections of the patient's blood-serum. By feeding ovomucoid in gradually increasing doses the patient became immune to egg. At the same time immunity to oatmeal and an apparently decreased susceptibility to almonds occurred. Judging from these results it would seem that the patient's allergic condition to the three dissimilar foods was in some way related. Our present knowledge of the subject is too meager, however, to interpret these results as proving that the original sensitization to egg or oats also sensitized the patient to almonds. Moreover, the results from a single case are insufficient data on which to base this view, which is not in accord with the current ideas of the specificity of anaphylaxis. Another possibility which must be considered is that the sensitization to eggs and oats, although not the direct cause of the patient's idiosyncrasy to almonds, may have served in some way as a predisposing cause.

**Wassermann Reaction in Infants and Children.**—F. S. Churchill (*Amer. Jour. Dis. Child.*, 1912, iii, 363) has found in a series of 101 hospital children tested by the Wassermann serum reaction, a large number of cases presenting a positive reaction, 38 per cent., over a third, giving such a result. The most of these, we

are justified in regarding as syphilis. Deducting ten cases without either family history, personal record or physical signs suggestive of syphilis, we have twenty-nine (28 per cent.) cases of syphilis among the first hundred children, selected mostly at random, in one of our large American hospitals; that is, nearly one out every three patients. The comparatively large number of positive cases without physical signs, the "symptomless" children, is a striking phenomenon, fourteen of the cases (37 per cent.) being so lacking. This is quite in keeping with the character of congenital syphilis, at least of the late variety, and emphasizes the difficulty of arriving at a diagnosis, and the importance of the serum test in unearthing these obscure cases. Though the series of cases is small the findings demonstrate the importance of the serum test in studying anemic, maldeveloped children and the desirability of applying this test on a large scale to these children, in order, first, to determine to what extent syphilis prevails among them, and, secondly, to institute proper treatment.

**Acute Duodenal Indigestion in Children.**—F. B. Talbot (*Amer. Jour. Dis. Child.*, 1912, iii, 398) has studied 24 cases of this trouble during the past year in the Out-patient Department of the Massachusetts General Hospital. Analysis of these cases showed that the disease came as a complication of such infections as otitis media, diphtheria, and the exanthemata in 15 per cent. of the cases. The onset was sudden with fever and vomiting in 75 per cent., and therefore suggested an infectious origin; the liver was enlarged in 74 per cent., and tender in 13 per cent.; the spleen was not felt in any case. Urobilinogen was absent from the urine in every case where there was complete obstruction to bile and was found in excessive amounts when the obstruction was removed. The stools were recorded as white in 36 per cent., creamy in 14 per cent., and clay colored in 50 per cent. of the cases during obstruction, and, under the microscope, always showed an excess of fat which was entirely in the form of soaps, while there was constipation, and as both fatty acids and soaps when there was diarrhea. In one instance in which the diet was particularly bad, there was also an excess of starch, but in all other cases starch and meat were perfectly digested. When the bile flows again into the intestine the fat quickly disappears from the stool and abnormal quantities of urobilinogen appear in the urine. Either the excessive amounts of urobilinogen are due to excessive putrefaction accompanying the disease, plus a diet containing a large amount of meat, or acute duodenal indigestion is not a simple blocking of the common duct by mucus. It is conceivable that the agent which caused the plug of mucus to form in the common duct may have extended up into the small bile capillaries of the liver. In that case, the liver cells could not act normally and urobilinogen would not be converted back into bilirubin in the normal manner; this would result in an obstruction in the liver, which would



cause urobilinogen to back up and overflow in excessive amounts in the urine. Metabolism experiments and an understanding of the physiology of bile makes it obvious that fat and sugars should be excluded from the diet. Conversely proteins, especially meat, fat-free milk, or skimmed milk, and thoroughly cooked simple starches (potato is the least digestible) may be safely given. Fortunately, the disease is of relatively short duration, because a fat-free diet could not supply the requisite number of calories to sustain health indefinitely. The appetite is always poor and can be best stimulated by tincture of *nux vomica*, in doses corresponding to the age of the patient. Mucus is the natural protective agent of the gastrointestinal canal and is thrown out by the mucous membrane whenever there is any form of irritant present. Mucus is soluble in alkalies and precipitated by acids, therefore, the mucus plug in the bile duct may be best reached by large doses of alkalies (for example, bicarbonate of soda).

**Diagnosis of Tuberculosis in the Nursling.**—Hutinal and Tixier (*Ann. de méd. et chir. inf.*, June 1, 1912) find that a careful search of the conditions under which a child suspected of tuberculosis has lived will be of great value in diagnosis. The infection may be transmitted to the child before birth, during intrauterine life, or later. The laboratory and cutaneous reactions for tuberculosis are of value, and radiology may be of great assistance in diagnosis. Congenital tuberculosis undoubtedly exists, but is rare. Milk is an exceptional source of infection, according to the author. Almost always the infection reaches the child from his surroundings. The bacillus may be sought for in the stomach contents, feces, blood serum and cerebrospinal fluid. Enlarged lymph nodes may be shown by radiology when present.

**Osteomuscular Dystrophy with Dwarfing.**—V. Hutinel and P. Harvier (*Arch. de méd. des enf.*, June, 1912) cite two cases observed by themselves, to which they add four others culled from literature, which they believe form a group of cases all of which show a special type, often appearing in adolescence, and more than one case in the same family. They are characterized by dwarfing of stature, late lesions of rachitis involving the bones, amyotrophy, and muscular impotence. With these changes may be associated adiposity, and retardation of the establishment of the menstrual function. The writers believe that this type of dystrophy is associated with lesions of the hypophysis. Autopsies have not as yet been possible which would establish this as a fact. The authors' cases were sisters. They showed dwarfing, rachitic malformations, muscular impotence, weakness, etc. The thyroid did not seem to be involved especially.



# THE AMERICAN 507 JOURNAL OF OBSTETRICS

AND

## DISEASES OF WOMEN AND CHILDREN.

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VOL. LXVI.

OCTOBER, 1912.

NO. 4

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### ORIGINAL COMMUNICATIONS.

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#### PHYSIOLOGY OF THE DUCTLESS GLANDS IN THEIR RELATIONS TO OBSTETRICS.\*

BY

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"The physiology of the internal secretions in twenty minutes" about represents the instructions received from your secretary when he requested me to prepare this paper. Such a feat might have been accomplished ten years ago when it almost meant danger to one's reputation and well-being to carry on researches on the ductless glands. But things have changed, and the field has become so vast that about all I shall be able to do in the time available will be to refer briefly to those features of the general subject which bear a direct connection with your special line of work.

"In Southern Italy it has long been the custom for the parent to measure the circumference of the daughter's neck before and after marriage, an increase in size being considered as an evidence of conception," as stated by Richardson. The clinical observations of Nicholson, Lange, and others, have fully confirmed the existence of a functional relationship between the reproductive organs and the thyroid. Moreover experiments upon pregnant and nonpregnant animals have shown that the pregnant animals require much more thyroid than those which were not pregnant. While the latter could exist normally with but one-fifth of the organ, if they became pregnant they speedily suffered from convulsions. Conversely, as Lanz and others have shown, even in herbivora, goats for example, which do not need

\* Read before the Philadelphia Obstetrical Society, May 2, 1912.

the thyroid as much as the carnivora, since they can live a long time after removal of the thyroid, the sexual and reproductive capacity is greatly impaired after this operative procedure. They either do not become pregnant or they abort. These and many other facts which could be adduced, bearing upon puberty, menstruation, lactation, menopause, etc., indicate clearly that during pregnancy the former takes part in the active process of fetal development.

What is the physiological rôle of the thyroid apparatus in this connection? It is one of such importance that if it were more generally known by the profession at large, and the therapeutic suggestions it offers more frequently heeded, puerperal complications could be prevented in many cases which at present only too often are lost.

What has been termed the "detoxicatory" functions of the thyroid apparatus has been before us many years. The theories which restricted the antitoxic process to the gland proper, this organ being supposed to detoxicate the blood coursing through it, have had their day. The only view which has survived the test of experimental inquiry is that based on Schiff's original idea that the thyroid supplies a secretion to the blood. Since his time, one of its rôles has been found to be the destruction of poisons in the blood—the all-important function referred to above. My own labors then suggested that the thyroid and parathyroids were directly connected with the production of antibodies and opsonins in the blood-stream, a view since confirmed by Fassin, Stepanoff and Marbé, the latter two observers working at the Pasteur Institute.

The rôle of the thyroid apparatus—by which I mean the thyroid and parathyroids—in pregnancy, thus becomes clear. During this physiological state, maternal wastes are not alone to be dealt with, but also those of the fetus. Hence the need of supplementary resources to convert them into eliminable end-products. The thyroparathyroid secretion taking part (with other antibodies let me add) in this process, the thyroid assumes greater activity and thereby serves to protect the maternal organism against harm. When this source of help fails, the antitoxic process is not completed and toxic intermediate wastes, which are extremely irritating to the kidney, are formed, giving rise to albuminuria, edema and other complications dreaded by obstetricians, and favoring the development of puerperal eclampsia. That we have in thyroid gland used

therapeutically, a potent aid in this connection has been sustained clinically.

The beneficial influence of thyroid preparations on lactation, pointed out by Hertoghe, Chéron and others, who found that in some cases of agalactia the secretion of milk was free as long as thyroid was taken and failed when it was neglected, is explained by the well-known influence of the gland on general metabolism, which it greatly enhances. The secreting elements of the mammary gland are simply rendered more active because cellular interchanges or vital activity in them is greatly activated. Besides the inherent help that small doses of thyroid afford, is the very important fact that the maternal milk serves not only to nourish the infant, but also to protect it against infection, while its own autoprotective organs are not sufficiently developed to defend it adequately. So marked is this defensive property of maternal milk that in 1870 during the siege of Paris, the mortality was lowered 40 per cent. because mothers were driven to nurse their babies for lack of cow's milk, although in the same period the general mortality in the city was doubled (Winters). As far back as 1892 Ehrlich and Brieger showed that when mice had been immunized against the action of tetanus toxin, their milk conferred the same immunity upon the mice they suckled. These and many other facts which could be adduced indicate not only that thyroid products increase the flow of milk, but also, through this fact, protect the infant if need be against infection.

Were the adrenals also situated under the skin, they could likewise be seen to enlarge during pregnancy. They are the seat of active hyperemia, their whole vascular supply being erethic, while their cellular elements show every evidence of abnormal activity. Neu has recently shown that the epinephrin in the blood corresponded quantitatively with the activity of the gestative process, including pregnancy, labor and the puerperal period. The prevailing conception of the action of the adrenal secretion that it serves to sustain the vasomotor tone through its action on the cardiovascular system, while perfectly correct, fails to account for this striking development of functional activity. But such is not the case with my own view that the adrenals sustain oxidation and metabolism. There is not only the normal maternal metabolism to subserve, but also that of the developing fetus and the vast up-building of tissue this process entails, the increase in size of the uterine walls, the de-



velopment of the placenta, etc. This relationship between the adrenals and parturition constitutes a new field for study. I may add for the benefit of those who might wish to take it up, that so eminent an author as Prof. Schäfer, also expressed the opinion, since I did so, that the adrenals were related to metabolic changes—the keynote, as I view it, of their connection with parturition.

The adrenals in the new-born merit even more than those of the mother—as far as present knowledge warrants—the attention of the obstetrician, for the destruction of these organs through local hemorrhage is a frequent—and let me say often unrecognized—cause of death in the nursling during the first few weeks of life. So common is adrenal hemorrhage in infants, in fact, that Loeper and Oppenheim found it in 45 per cent. of 250 nurslings examined postmortem. How is it produced?

Various toxic substances, pneumobacillus cultures, diphtheria and other toxins, vegetable poisons, etc., have been shown to cause when injected experimentally, congestion of the adrenals—so marked in some instances as to provoke rupture of their vessels. All the investigators who have reported these observations agree that the organs give the typical signs of marked activity in addition to the vascular engorgement. Whatever the purpose of this activity is, whether to sustain the cardiovascular tonus, or whether, as I believe, to sustain metabolism or carry on both these functions—which is probably the truth—the fact remains that the two salient points to remember are that while overactive adrenals raise the blood-pressure in proportion, the adrenals of the infant are relatively very large while their parenchyma is extremely friable. The meaning of high blood-pressure under these conditions is self-evident: the contracted arteries of the body at large so increase the pressure in the delicate adrenal vessels—which are in reality but sinusoidal capillaries—that they rupture, thus constituting adrenal hemorrhage.

But through what agency are the poisons which cause adrenal hemorrhage produced in the new-born? Barring the occasional cases of this condition due to trauma or pressure during birth, we are brought to the protective influence of the mother over her infant. A child borne with toxic wastes in its blood, because its mother through inadequate autoprotective functions has not kept its, and her blood, free of them, is a candidate for adrenal hemorrhage. In many instances even the maternal milk, through its antitoxic properties, fails to save the infant; but what is the prognosis of such infants when artificially fed? Ample evidence



is available to show the evil influence of the latter. The moral of all these facts is plain: By the judicious use of thyroid gland during parturition, when indications for it are present, you can not only protect the mother, but also her child, both while it is *in utero*, and through her milk after birth.

Concerning the other organs which have been classified as ductless glands that have proven of interest to obstetricians, the pituitary body, ovaries and Graafian follicles, I am brought, through the fact that I am restricted to the physiology of these organs as ductless glands, to state that I am still to be convinced that they produce *bona fide* internal secretions. It has long been my opinion, though quite prepared to yield to substantial proof to the contrary, that true internal secretions are by no means as numerous in the body as they are thought to be, and that the effects obtained from many organic extracts do not represent those of any internal secretion whatsoever. They are from my viewpoint mere tissue extracts, whose effects, therefore, are all very similar, the variations observed being due to the differences in the composition of these tissues. The posterior portion of the pituitary body, for example, is known to be rich in nerve-cells, while the ovaries and Graafian follicles are rich in nucleins. Yet all these tissues give the chromaffin test, showing that all are rich in adrenal substance though closely bound up in organic combination with the specific tissues of each organ. Under these conditions, we should obtain the effects of the adrenal extractives from all these organs; this is precisely what we do get: all are oxidizing agents, raise the blood-pressure, slow the heart beat, and enhance metabolism. This applies also to kidney and testicular extracts. They all belong also to what has been termed the chromaffin system and are closely related to one another through the sympathetic system which plays an important part in the many functional relationships they so plainly show. We obtain a sudden rise of blood-pressure from pure adrenal extractives and a rapid fall from extracts of the other organs; the rise of blood-pressure is of longer duration because the adrenal extractives here are in combination with other organic substances which, to a material degree, prolong and modify its action. All this does not impair in the least the therapeutic and special value of each of these different extracts; it only deprives them of what appear to me as fictitious functions, that is to say, functions which on insufficient grounds have been compared to those of a *bona fide* internal secretion, that of the adrenals for example.

## THE THERAPEUTIC APPLICATION OF THE DUCTLESS GLANDS.\*

BY

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To attempt to discuss the subject of the therapeutic application of the ductless glands in the brief space of time which it is possible to permit me to use at this meeting is a hopeless task, for no subject has attracted more attention in the last fifteen years and no subject has developed more experimental research and practical application. Although it is true that every ductless gland has been proved to possess a definite physiological action constantly or inconstantly exercised, it is also true that much of our knowledge concerning these effects is very crude indeed, and I believe that the time is not far distant when we will recognize that these glands can be used in three different ways, viz., to produce a sudden, positive and easily demonstrable effect, to cause certain changes in physiological function which are capable of being recognized only after the results of these changes have had time to develop, and lastly, that a considerable part of our drug therapy will be found to depend upon the effect which these substances (that is, the glands) exercise when under the influence of drugs. Crude and yet accurate as our studies have been in the past as to the effects of drugs on the circulation, respiration and the blood, there still remain two fields of research manifestly untouched, namely, the effects of drugs on the ductless glands and the effects of drugs on the circulation of lymph and on the lymph nodes. If this is true of the effects of drugs it is even more true of the effects on the extracts of the ductless glands when they are injected into the body.

Invited as I am to address an Obstetrical Society and limited as to time, it is proper to consider at this time the ductless glands and their products which chiefly interest accoucheurs. Of these glandular products certainly the one which seems to demand our interest and use more than any other is pituitrin, the active principle of the pituitary body. It has not had the use in this country that it has had in Germany where clinicians of large opportunities have given it adequate trial and high praise. It will be recalled

\* Read before the Philadelphia Obstetrical Society, May 2, 1912.

that pituitrin is obtained from the posterior or infundibular portion of the pituitary body, and that when injected subcutaneously or into a vein it causes a rise of blood pressure very similar to that produced by an intravenous injection of adrenalin, save that the effect is more gradual in its onset and very much more prolonged in its maintenance, this rise in blood pressure being due to constriction of the peripheral blood-vessels which, like that caused by adrenalin, depends upon an effect exercised upon the muscular coats of these vessels rather than through any influence upon the vasomotor center. The peripheral action of this drug therefore renders it useful in instances in which, as a result of shock, there is a fall of blood pressure depending upon depression of the vasomotor center which in its depression might fail to respond to a drug which raised pressure by direct action on this center. The rise in blood pressure is probably responsible to a considerable degree for the slowing of the pulse which is produced by its use. Associated with this influence upon the circulation it is interesting and somewhat surprising to learn that pituitrin causes a marked increase in urinary flow, since one would suppose, *a priori*, that a drug which contracted peripheral vessels would contract the renal vessels and diminish the quantity of blood going to the kidneys. As a matter of fact, clinical studies show that the blood-vessels of the kidney seem to be dilated under its influence and that in instances where partial or complete suppression of urine follows labor or operative interference upon the genitourinary tract, it is an efficient remedy to reestablish urinary secretion. Furthermore, Hofstetter believes it to exercise a stimulant effect upon the muscular coats of the bladder and therefore believes that it relieves vesical atony, with the further advantage that by its use it is often possible to avoid the use of the catheter.

When we come to a consideration of the direct effect of pituitrin upon the uterus we find, as I have already stated, that a very large number of papers have been contributed by Continental authorities concerning its influence upon this viscus, either for the purpose of influencing the uterine circulation in nonpregnant women, for the purpose of producing uterine contractions when the pregnancy has reached its completion, or in place of ergot in the later stages of labor to diminish the possibility of or to control actual postpartum hemorrhage. Foges and Hofstetter believe that it is superior to ergot for this purpose. It acts so promptly, too, that it may be given after delivery to



aid in the expulsion of the placenta. Kehrer asserts that pituitrin has proved in his hands to be the best ecbotic agent, but adds that he has never seen it produce tonic and unyielding contractions but only the to-and-fro contractions which are so desirable. His observations have been confirmed by Bagger-Joergensen, who finds with Hofbauer that pituitrin is a powerful and reliable oxytotic which does not act deleteriously upon the fetus.

In a case reported by Gottfried, a woman who had been pregnant for eleven lunar months came under observation and an attempt was made to induce uterine contractions with hot baths and quinine with practically no result; whereas, an injection of a small amount of pituitrin produced active uterine contractions within fifteen minutes whereby pregnancy was terminated. That the pituitrin acts very promptly, when given hypodermically, upon the uterine contractions seems to be universally admitted; ten minutes being the average time which elapses before some evidences of its uterine effect becomes manifest. Schiffmann has used pituitrin in this manner for the purpose of causing uterine contractions where it was desirable, owing to the fact that abortion was necessary. The proper method where it is desired to empty the uterus before pregnancy has been completed would seem to be to produce artificial dilatation of the os and then give the pituitrin hypodermically, since in instances in which it is given without this preliminary dilatation no effect seems to be produced. In other words, it aids in the induction of abortion but does not lend itself to the task of being solely responsible. In cases of uterine inertia due to unknown causes or due to exhaustion of the patient it may also be used with advantage, and as far as I have been able to learn from a fairly careful study of the literature, it does not seem to possess any unfavorable after-effects either upon the mother or her offspring. Injection may be made in any part of the body, either an extremity or the trunk.

So far as the effect on the child is concerned most observers claim that it increases the strength of the fetal cardiac contractions, but the question has not as yet been decided whether this is due to some direct effect of the drug or to changes in the uterine circulation. In an investigation made upon no less than eighty-one cases by Studeny he took care that no psychic influence was exercised which might impair the scientific accuracy of his observation, depending solely upon the drug for



the effect which he sought. He also believes that pituitrin is the most reliable ecboic agent known at the present time. His paper is published in the *Wiener klinische Wochenschrift* for December 21, 1911. A more recent paper which is in accord with those already quoted is that of Fischer, which is published in the *Centralblatt für Gynäkologie*, No. 1, 1912, and one by Nagy of Budapest in the same journal for March 9, 1912. Time does not permit me to go more exhaustively into this literature which can be found scattered not only through the obstetrical and gynecological journals but also those which deal with general medicine as well.

Although it is true that the pituitary body seems to exercise a greater influence upon the uterine muscle and its blood-vessels than do any of the other ductless glands, it is not to be forgotten that there are other substances which are of great interest to the obstetrician and gynecologist, notably, extract of corpus luteum, which is now placed upon the market in tablet or capsule form and which, in my limited experience, certainly exercises a very advantageous influence. It is a noteworthy fact that heretofore ovarian extract while highly recommended by certain persons for the purpose of combating the symptoms of the menopause, whether artificially or naturally induced, has not obtained the popularity in the profession that it would have obtained had it really possessed the powers which some enthusiasts believe it has. While it may be true that the ovary *in situ* produced an internal secretion which materially modifies the functions of all women during the child-bearing period, and before and after this period, it would seem that this effect is produced not so much by the secretion of the ovary itself as by the absorption of products from the corpus luteum. Possibly the divergent results which have been obtained in the past from the use of ovarian extract have depended for their existence upon the fact that the ovaries used were obtained from animals at periods near or remote from that of "heat," for Champy and Gley found that the extracts of the corpus luteum of the nonpregnant cow seemed to be possessed of little physiological action and that some of the commercial extracts when prepared most carefully are inert; whereas extracts of the corpus luteum of the pregnant cow are exceedingly active when made in the physiological laboratory or for commercial purposes. The same thing holds true of the pregnant sheep but less so of that of pregnant mares. Their observations, however, indicated that the corpus luteum of the pregnant sow

is more active than any other. According to the investigations of Ott and Scott, which have been published during the past month the extract of corpus luteum has practically no effect upon urinary secretion but acts as a stimulant to the pregnant uterus. So far as I know, no accurate investigations have been made concerning the effect of this substance upon the circulation and other vital functions. The cases to which I have given it have been those presenting the nervous and mental symptoms of the artificial menopause, and with it I have succeeded after having failed with all of the older remedies.

There is still another field of physiological investigation in regard to internal secretions which has as yet not been carried to a point in which therapeutic application can be made, namely, the employment of so-called hormones for the purpose of stimulating or inducing functional activity. Recent researches, with which you may be familiar, would seem to indicate that the pregnant uterus develops a hormone which, carried to the mammary glands, causes the development and the ultimate secretion of milk, and, conversely, it would seem probable that a hormone is in turn responsible for the uterine contractions whereby labor is begun. Some of these researches would seem to indicate that the mammary glands "pays back in its own coin" the uterus which primarily instigated their development. Of course, in one sense it may be said that pituitrin in producing the results to which I have already referred acts as a hormone, or acts as a substitute for a hormone which has not been developed.

1801 SPRUCE STREET.

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## THE USE OF PITUITARY EXTRACT IN OBSTETRICS.\*

BY

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It has been proven repeatedly that the secretions of the ductless glands play an important rôle in general metabolism. Deficient action or pathological changes in these structures—thyroid, suprarenal or pituitary, cause marked changes, especially in the cardiovascular and nervous systems.

Dale, Bell, Howard and Isaac Ott have noted a marked rise in blood-pressure accompanied by slowing of the heart beat and an increase in the amount of urine, following the injection of pituitary extract.

\* Read before the Philadelphia Obstetrical Society, May 2, 1912.

Isaac Ott demonstrated that by injecting pituitary extract into the vein of a goat's ear during the early nursing period the secretion of milk was greatly increased, the flow starting in one minute and reaching its height in four minutes, then gradually returning to normal. Ott considers it the most powerful galactagogue, increasing the flow of milk one-hundred fold. The increased lactation is attributed to the hormones of the internal secretions together with a vasodilatation of the gland itself.

My paper is in the nature of a clinical report on the use of pituitary extract to determine its action on the mammary glands, cardiovascular system and uterus.

CASE I.—Mrs. S., primipara, age twenty-five, entered the hospital in labor January 30, 1911, near full term. She gave a history of having attempted to terminate pregnancy twice during the two last months of gestation.

On the sixth day of the puerperium she developed a pelvic peritonitis; an abscess developed which was opened and drained in the right inguinal region. The breasts were soft and no milk could be withdrawn with the breast-pump. Two weeks later after the fever had subsided 1 c.c. of pituitary extract was injected deeply into the insertion of the deltoid at 6 P.M. The following morning a thin watery secretion was noticed by the patient coming from the left nipple sufficiently to moisten the breast binder. One-half dram of milk was withdrawn by the breast-pump.

She left the hospital on the following day, and on her return three weeks later for examination, stated that the secretion lasted four days.

CASE II.—Mrs. H. entered the hospital on the eleventh day of the puerperium suffering from a gonorrheal infection.

No milk could be withdrawn from the breasts since the birth of her child, which was being fed artificially. At the end of the third week when the temperature was normal, pulse 114, systolic pressure 98, diastolic 85, 1 c.c. of pituitary extract was injected into the upper arm. Thirty minutes later the pulse was 96, systolic pressure 105, diastolic 95. The following day 1 c.c. was injected into the upper arm. Six hours later 1 1/2 drams of milk were withdrawn from the left breast and 1 dram from the right.

CASE III.—Mrs. H., age thirty, vii-para, entered the hospital March 12, 1912, suffering from eclampsia. Medical treatment having failed to control the convulsions, labor was induced. As not more than 1 dram of milk could be withdrawn from the breasts in twenty-four hours for the first two weeks of the puerperium, the child was nourished artificially. On the sixteenth day of the puerperium the pulse being 88, systolic pressure 112, 1 c.c. of pituitary extract was injected into the upper arm. Thirty minutes later the pulse was 80 and systolic pressure 120.



Two and one-half drams of milk were withdrawn from the breasts. She was given three more injections of 1 c.c. each during the following thirty-six hours; the child was placed to the breast every second hour and for the remaining three days while she was in the hospital, the child received sufficient nourishment from the breasts without resorting to artificial feeding.

Pituitary extract was used during the febrile period in the cases cited with a negative result. Notwithstanding the fact that these three cases were recovering from severe infections and were unfavorable subjects for experimentation, the action of pituitary extract seems all the more remarkable.

CASE IV.—As an example of deficient milk secretion without apparent cause, the following case is rather interesting. —, negress age thirty-five, well nourished, viii-para, all labors normal, delivered of a well-developed child, February 12, 1912. The patient stated that she never had enough milk in her breasts to nourish her children, being compelled to resort to artificial feeding in conjunction with breast milk. Although the child was placed to the breast every second hour during the first six days of the puerperium it received insufficient nourishment. On the sixth day two hours after nursing  $1\frac{1}{2}$  dram of milk was withdrawn from the left breast and twenty drops from the right. One cubic centimeter of pituitary extract was injected into the insertion of the deltoid. Thirty minutes later 10 drams of milk were withdrawn from the left breast and 8 drams from the right.

Following the injection the breasts became firmer and secreted an abundant supply of milk until she left the hospital on the thirteenth day.

The following cases, I believe, serve to show the effect of pituitary extract on the uterine muscle.

CASE V.—Mrs. Z., Lithuanian, v-para, all labors normal. She was delivered of her last child March 12, 1912, after a normal labor lasting twelve hours. She remained in bed seven days, during which time she had no fever, and the lochia was normal in amount and odorless. On the fourteenth day she began to bleed freely at intervals, especially while doing housework. She went to bed and remained one day, the treatment consisting of ergot, quinine, strychnine and hot vaginal douches. On resuming her work the bleeding became more profuse and hot vaginal douches were used with indifferent results. I examined her at the suggestion of the attending physician on the twenty-third day of the puerperium. Several hours previously she had bled profusely and was compelled to go to bed from weakness due to loss of blood. The vagina had been packed with gauze. The pulse was 120 and temperature 97. A bimanual examination revealed a large, soft uterus, freely movable, the fundus on a level with the umbilicus, the cervix dilated sufficiently to admit one finger and a slight unilateral laceration of the cervix. No



tenderness could be detected over the uterus, tubes or ovaries. One cubic centimeter of pituitary extract was injected into the deltoid muscle of the upper arm. Thirty minutes later the uterus was much firmer and could be outlined distinctly through the abdominal wall. Two more injections of 1 c.c. each were given during the following twenty-four hours. The fundus uteri at this time was 2 1/2 inches above the symphysis pubis. The first three days following the injections a slight flow of bright red blood was noticed.


The patient remained in bed five days following the injection, the treatment consisting of quinine 2 gr. and strychnine 1/60 gr. three times a day. A bimanual examination five days later revealed the uterus well contracted and retroverted in the cavity of the pelvis, but no evidence of bleeding, the patient at this time being able to resume her household duties.

CASE VI.—L. H., primpara, age twenty, delivered at term of a normal child weighing 8 pounds. She remained in bed nine days and left the hospital on the thirteenth day. The uterus at this time was slightly enlarged, but in good position. She obtained a position as a servant to do general housework, and in four or five days noticed a free discharge of blood accompanied by pain in the lumbar region. Five weeks later she was brought into the hospital suffering from a uterine hemorrhage. The treatment was a hot uterine douche, and quinine and strychnine internally. She remained in bed ten days. Two days after getting out of bed the discharge tinged with blood became more profuse. The fundus uteri at this time was 4 inches above the symphysis.

One cubic centimeter of pituitary extract was given intramuscularly and in fifteen minutes the patient complained of "bearing down pains in her abdomen just like labor pains." The following day another injection was given with the same result. One hour later the fundus was 2 inches above the symphysis.

A slight blood tinged discharge persisted for three days. One week later a slight serous discharge appeared on exertion, but no evidence of bleeding.

My experience with pituitary extract has led to the following conclusions:

It is inactive in the presence of fever. 

It is a powerful galactagogue.

It stimulates uterine contractions in from fifteen to thirty minutes after being injected intramuscularly.

It causes a rise of blood-pressure and slowing of the pulse; the highest pressure occurring between twenty and thirty minutes after the injection.

It does not cause an inflammatory reaction at the site of the injection or any noticeable nervous symptoms.

## THE PRESENT STATUS OF CORPUS LUTEUM ORGANO-THERAPY.\*

BY

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THE corpus luteum is a structure which forms in the ovary at the site of a ruptured Graafian follicle. In the earliest stages it is simply a ruptured follicle filled with blood outside of which is a narrow yellow ring formed by the lutein cells of the theca, which, however, proliferate rapidly and invade the blood-filled follicle, forming a festooned layer about its central blood clot. (Williams). This clot presents a yellowish color externally, while its central portion is of a reddish-gray hue. It gradually becomes organized, contracts, is slowly absorbed without the formation of cicatricial tissue, and finally disappears by a process of hyaline degeneration.

There are two views as to the origin of the lutein cells. The first and most generally accepted, is that they are of connective tissue origin and represent the cells of the theca interna; the second, that they originate from epithelial cells and are derived from that of the membrana granulosa. The corpus luteum of pregnancy, or the true corpus luteum, and the corpus luteum of menstruation, or the false corpus luteum, present exactly the same structure but vary in size and duration.

The corpora lutea have several functions according to recent investigations:

First: They bring about obliteration of the ruptured Graafian follicle without the formation of cicatricial tissue.

Second: According to Frankel, they prepare the mucosa of the uterus for the reception of the ovum.

Third: They dominate the occurrence of menstruation.

Fourth: The conclusive and convincing studies of Loeb prove that they are indispensable for the formation of the maternal placenta.

Fifth: "The corpus luteum changes the periodicity of the sexual cycle; it prolongs the sexual period, the interval between two successive ovulations, by preventing the rupture of the follicle." (Loeb.)

Sixth: Rebaudi believes he has demonstrated a functional

\* Read before the Philadelphia Obstetrical Society, May 2, 1912

connection between the pancreas and the ovaries, and that when the functioning of the corpus luteum was deficient, the islands of Langerhans in the pancreas became hypertrophied and were evidently doing extra work. Similar changes were noted after the removal of both ovaries, or after the destruction of the corpora lutea alone.

Seventh: The corpus luteum seems to resemble the adrenals in its effects upon blood-pressure and the vasomotor system.

A study of these phenomena appears to prove that the ovary has an internal secretion which is produced by the corpus luteum. Although many gynecologists are skeptical in regard to the theory of internal secretion and believe that the only function of the ovary is the development of the ova; yet the consensus of medical opinion at the present time is preponderantly in favor of the theory.

Herman cites the fact that osteomalacia is frequently cured by the removal of the ovaries, as an evidence that the secretion, when in excess, produces softening of the bone and a copious excretion of phosphates in the urine. He believes that this secretion renders the tissues a fitter food for the cancer protozoon; for cases have been reported in which the removal of the ovaries combined with the administration of thyroid extract, has produced surprising diminution and retrogression of cancer in young women.

Assuming then the truth of the internal secretion theory, what is the best method of obtaining an extract of the corpus luteum for therapeutic use, what is the dosage and its physiologic action, what are the dangers to be avoided in its employment, and what are the indications for its use?

The preparation employed should be the desiccated extract, carefully prepared, as fresh glandular tissue is a most delicate substance and requires the most careful handling. Extremes of heat and cold, or strong chemicals will serve to render the extract inert. A fluid extract, whether aqueous or glycerinated, is not entirely free from objections. Until the active principle of the gland is isolated, the dried powdered extract is probably the best form to use.

Morley in a private communication, informs me that he is employing rectal suppositories of the extract in order to avoid the gastric symptoms which sometimes follow administration by mouth. The usual dosage is 5 grains, three times daily.

Bouin, Ansel, and Villemin found that the primary effect of

toxic doses of lutein extract was a violent elevation of blood-pressure, sufficient to produce effusion into all serous cavities. The physiologic effects of therapeutic doses have not been sufficiently studied to show positively that they are all those of the adrenal preparations, though what is known points in that direction. In one instance, I was compelled to reduce the dose because of marked cardiac palpitation following its use.

*Therapeutics.*—It may be said that the evidence as to the therapeutic value of the desiccated corpus luteum, is conflicting. One writer relates brilliant results, while another equally reliable authority fails to secure any results. This failure may be due, either to the use of inert substance, or a carelessly prepared extract; or to its employment in a case in which an agent influencing the vasomotor system is not indicated. However, a résumé of the literature shows an increasingly large number of men who are securing favorable results from the use of ovarian or corpus luteum extract. It has been employed in the treatment of the artificial or postoperative menopause, and also for the relief of the nervous symptoms of the natural menopause. McDonald has found it particularly valuable in the treatment of scanty menstruation. The value of its use in such cases has been confirmed by Dercum in a personal communication to the writer.

Lebreton has employed it in disturbances of pregnancy, believing these disturbances are due to an autointoxication which is caused by the functional insufficiency of the corpora lutea. He gave it to patients who complained of nausea, vomiting, attacks of suffocation, palpitation of heart, or congestion. The result was shown by an immediate cessation of the vomiting, while the other troublesome symptoms were rapidly ameliorated.

Drevet reports his results in thirty cases, and concludes that the symptoms which improved the most, are, on the one hand, dysmenorrhea and on the other, the reflex troubles of a nervous and congestive order.

Another therapeutic indication for lutein is, in the treatment of pregnant women on whom operations have been performed and in whom miscarriage is feared. This is particularly true of the early weeks of pregnancy during the imbedding of the ovum, as it has been shown experimentally that the corpus luteum has a definite effect under such circumstances. From reports there is reason to believe that it will prove valuable in cases of osteomalacia and as a galactagogue.



After a careful study of the literature and the observation of our own patients, I believe that the following conclusions formulated by Morley are justifiable:

1. The ovary possesses an internal secretion.
2. This internal secretion is produced by the corpus luteum.
3. In so-called ovarian insufficiency, relief may be obtained with an extract of the corpus luteum.
4. No untoward symptoms result from its use in conditions where it is indicated, even if no relief is obtained.
5. The extract should be given a fair trial before it is discontinued.
6. The extract used should be one that has been carefully prepared.
7. All glands that possess an internal secretion are more or less intimately connected.
8. Further experimental work will no doubt add new light to many of the questions that are still in a nebulous stage.

127 NORTH TWENTIETH STREET.

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## A STUDY OF CERTAIN ASPECTS OF COMPARATIVE ANATOMY ILLUMINATING THE ARCHITECTURE AND PHYSIOLOGY OF THE HUMAN PELVIS.

BY

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CONSIDERED as a factor in vertebrate phylogeny the pelvis is in unstable equilibrium, developing in some parts, degenerating in others, in response to the various physiologic stimuli resulting from environment. Though the isolated human pelvis may seem a rigid and completed structure, it becomes at once evident when we study it as one member in the vertebrate series that the flux of necessity is alone required to soften its outlines and render it again plastic enough to be molded into any form adapting it better to make the struggle for existence. To the close observer this mutability is indeed quite as demonstrable of the species as it is of the phylum, and of the human pelvis as of that of any other vertebrate, for individual variation is an essential to all biologic progress, and even between the different races of man there occur certain minor yet purposeful variations from the so-called normal type of human pelvic architecture. The constant differences due to special sex activity between the

male and female pelvis of all primates are matters of rudimentary knowledge.\*

As compared with the pelvis of lower mammals the lightness and smoothness of the human pelvis, as well as its strength and economy of construction and graceful curves, bear indubitable testimony to its highly specialized function, and to the fact that



FIG. 1. -Pelvis of two-year old female chimpanzee. (After Wiedersheim.)  
For lateral profile, see Fig. 9.

its owner represents, for the present, the ultimate product of the evolution of his phylum. Phylogenetically the human pelvis is as far above that of other mammals as are those in turn above the crude and massive pelvic girdles of the mammals of paleontology.

These changes and refinements in the human pelvis are primarily incidental to the erect posture and gait, to the weight and

\*For example: The increased roundness and roominess of the pelvis of the female *Simia Satyrus* (Chimpanzee) (see Fig. 1) over that of the male of the same species is apparent even without measurements. The lower pelvis of the female gorilla (see Fig. 2) is shorter and less tubular than that of the male (see Fig. 3).

Pelvic mutability in response to physiological requirements reaches its climax in the pelvis of those grotesque mammals, the bat and the sloth, which spend a great part of their lives hanging by all fours, back downward, from branches. The pelvis of the sloth looks in profile like an inverted quadrant pivoted on a curiously drawn out and pointed symphysis from which hangs the thinned and hollowed dorsal pelvis. The dependent part is converted into a great scoop by complete ossification of the sacrosciatic ligaments. In this basket-shaped structure are carried the better part of the animal's inverted viscera (see Fig. 4).



FIG. 2.—Pelvis of adult female gorilla; to show pelvic inlet. Note expanded and outflanged ischial tuberosities. Note that as compared with the male pelvis, this pelvic cavity is more globular in shape. *Count the ribs.* From a Field Museum specimen.\*



FIG. 3.—Pelvis of adult male gorilla. Note the elongated and tubular shape of the true pelvis as compared with that of the female of the same species. From a Field Museum specimen.

\* The author wishes to express his appreciation of the courtesy and assistance of the staff of the Field Museum of Natural History in the preparation of the photographs which illustrate this article.

work of the human individual, and to the obstetric habits of the species.

Compared with the elongated and irregular pelvic cylinder of other mammals the human pelvis is elegantly spheroidal or ellipsoidal, and is built up from superimposed segments of two unequal spheres or ellipsoids. (See Figs. 5, 6, and 7.)

The spherical contours of the lower human pelvis are without doubt chiefly responsive to the pressure stimulus of the gravid



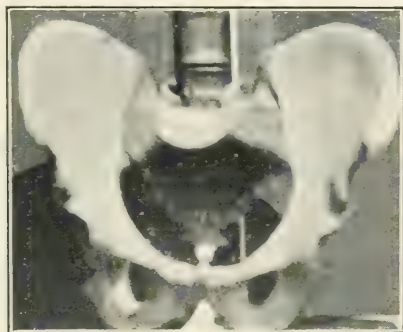
FIG. 4.—Pelvis of two-toed sloth—(*Choloepus didactylus*). From a Field Museum specimen.

uterus and the globular fetal head. This spherical form is secured by a hollowing out of the sacrum and iliac wing, not evident in the flat and elongated pelvis of the gorilla, orang, and chimpanzee. Even these primates lack the sacral promontory; the dorso-lumbo-sacro-coccygeal spine is nearly a straight line;\* and the pelvis is a flattened tube or cylinder and not a sphere. The orang pelvis is singularly human and more spherical than that of any other monkey; yet as in all other monkeys the sacrum is straight and insignificant (see Fig. 1), the symphysis long and flattened

\* Or rather, a gently bent bow with the concavity forward. (See Figs. 8 and 9.) In addition the spine is inclined forward—*always*. No other primate walks erect with the erectness of man.



(see Fig. 3), the pelvic axis straight (see Fig. 8), and the entire pelvis flattened anteroposteriorly (see Fig. 9). This flattening however is not at the expense of the anteroposterior inlet diameter, which is relatively much greater than that of man,\* but is secured by pushing the symphysis postaxially, thus



*a*



*b*

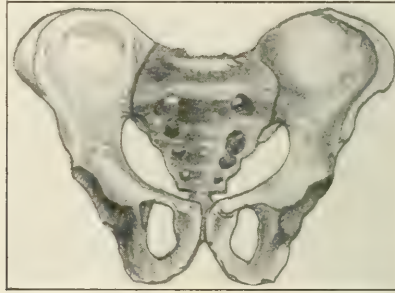
FIG. 5, *a* and *b*.—*a*. Human pelvic inlet; *b*. Human pelvic outlet. (Sex characteristics atypical.)

bringing the plane of the pelvic inlet nearly in line with the body axis and approximating the symphysis and the coccyx (see Fig. 9).

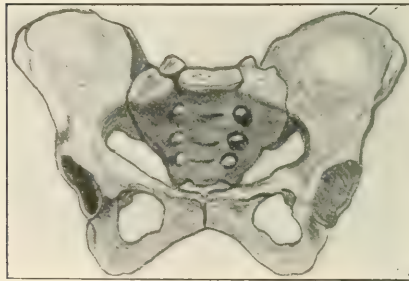
The tendency toward sphericity in the human pelvis is also evident at the outlet, which is nearly closed by the incurved coccyx and ischial spines and tuberosities. In other primates the coccyx is straight and the ischial tuberosities broad, out-flanged, and protuberant (see Figs. 10 and 11).

\* In the male gorilla the conjugate diameter at the inlet is to the transverse as 16 to 10, in the female as 14 to 10; in the chimpanzee as 20 to 10. The inlet and outlet diameters of most mammals are nearly equal.

The generous and graceful rounding of the human upper pelvis into the segment of a larger sphere is due to the stimulus of the perpendicular pressure of the abdominal viscera. Even in the orang, gorilla, and chimpanzee the "slanting" posture renders it impossible for the iliac alæ to support the viscera (see Fig. 12, also Figs. 8 and 9); hence these wings are not basin-shaped and produced ventrally to include more than half the upper pelvic circumference as in man, but are flattened dorsoventrally and



a

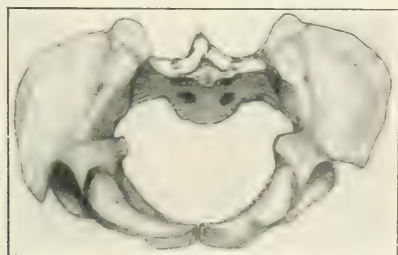


b

FIG. 6, *a* and *b*.—*a*. Typical male human pelvic inlet; *b*. typical female human pelvic inlet.

produced preaxially along the spines, facing directly ventrally like the blades of a pair of spoon oars. The extent of this difference between man and his nearest neighbor is shown by the fact that even in the upper apes (gorilla) a line connecting the anterior superior iliac spines nearly cuts the bodies of the lumbar vertebræ (see Figs. 8, 9, 10 and 11). The iliac wings of mammals other than man serve merely as points for muscular origin, and not for visceral support.

As compared with the human pelvis that of all other primates is noticeably elongated, and as straight and rigid as an old-fashioned corset. In the gorilla the enormously long inflexible lines which run parallel to the spine from the ischial tuberosities to the iliac crests give to the pelvis, even when separated from the rest of the skeleton, a singularly ferocious and sinister appearance, like that of a distorted human being (see Figs. 1, 3, 8 and 9). This lengthening of the dorsal part of the pelvis is



*a*



*b*

FIG. 7, *a* and *b*.—*a*. The outlet, male human pelvis: *b*. the outlet, female human pelvis. Sex characteristics well defined in both.

due to postaxial extension of the ischial tuberosities, production of the iliac part of the iliopectineal line, and preaxial development of the iliac crests. The purpose of all these pelvic extensions is obvious when we consider the muscular attachments necessary to develop the tremendous leaping power residing in the posterior limb of the lower primate. Maximum projection of the ischial and iliac "posts" is attained in the kangaroo, in which they are developed coincidentally with the great leaping muscles of the thigh and buttock.

The body weight which the four-footed animal divides between the shoulder and pelvic girdles is concentrated in man upon the structures grouped about the pelvis, and especially about the sacrum, acetabula and ischial tuberosities. Concentration of perpendicularly imposed load on the sacrum and dorsal half of the human innominate bones results (a) in *axial compression* and *shortening*, and (b) in strengthening of the dorsal parts of the



FIG. 8.—Spine and pelvis of adult male gorilla. Note inclination of spine and absence of secondary curves characteristic of man. From a Field Museum specimen.

pelvis, especially in the lines of resistance to axial pressure and strain. With the development of the tendency toward upright progression occurs inevitably a development of the sacrum and dorsal pelvis at the expense of the pubis and ventral pelvis. In the avian pelvis (see Fig. 13) the anterior arch has vanished; and even in the lower primate as compared with man, the sacrum is



stunted and insignificant and the ischiopubic pelvis of heavier construction.

The drawings and experiments of P. Lesshaft\* illustrate admirably the development of resistance lines in the dorsal human pelvis at points where the perpendicular load is greatest

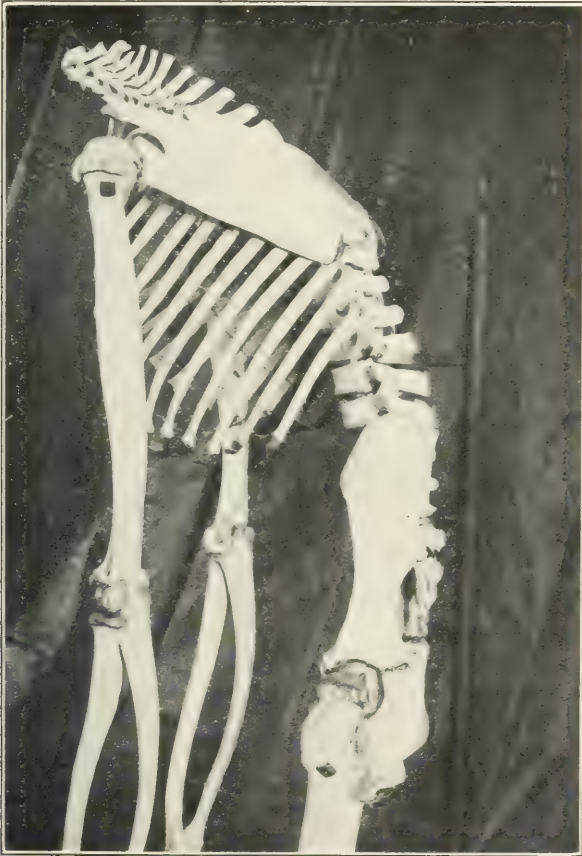


FIG. 9.—Skeleton of young chimpanzee in profile. Note enormous axial prolongation of pelvis with anteroposterior flattening. Also forward inclination of spine. From a Field Museum specimen.

(see Fig. 14). Such lines are built directly upward and inward into an arch extending from the ischial tuberosity and heavily buttressed acetabulum, through the massive iliac body and sacral lateral mass to a central although somewhat inverted keystone in the broad angular sacral promontory. Great bony

\* Merkel and Bonnet, *Anat. Hefte, Erste Abth.*, June 15, 1894, pp. 173-227.

strength is reinforced by massive sacroiliac, sacrosciatic, and acetabular ligaments, which, by introducing an element of elasticity, increase still more the ability of this posterior pelvic arch to resist forces applied in the direct line of the body axis.

To provide for strength in the sitting posture, in which the human individual habitually spends a certain portion of his life, the posterior arch is provided with strongly developed postaxial ligamentous sacrosciatic extensions into the ischial spines and tuberosities, into which the downward pressure is distributed

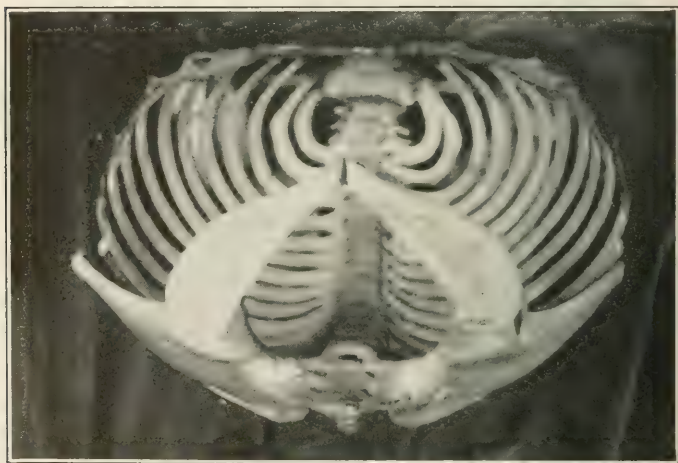


FIG. 10.—Pelvic outlet of the male gorilla. Note the lack of sacral promontory and pelvic curve, also the wide open outlet. Note the enormous ischial tuberosities; the “seating apparatus” of the ape extended as far forward as the pubic symphysis. From a Field Museum specimen.

when the individual is seated. These ligaments are not peculiar to man, and in some animals increase of pressure has led to their complete ossification (see Fig. 4).

Fracture of the human pelvis through any of these dorsal lines is comparatively rare and requires force which is both massive and concentrated. The experiments of Lesshaft demonstrate the astounding fact that the axial planes of the dorsal arch of the average adult human pelvis are able to sustain without fracture or dislocation an average perpendicular load of 2759 pounds.\*

Coincidentally with shortening of the human pelvic axis by compression, occurs *lateral and conjugate expansion*; in the former

\* Minimum load sustained before fracture 1100 pounds; maximum 5144 pounds.

direction as incidental to better and broader support during upright locomotion, in both directions as an obstetric necessity.

As a secondary necessity incidental to the upright posture, occurs expansion and thinning of the human iliac wings for the support of the abdominal viscera and the gravid uterus, and in all the higher primates for the attachment of the muscles neces-

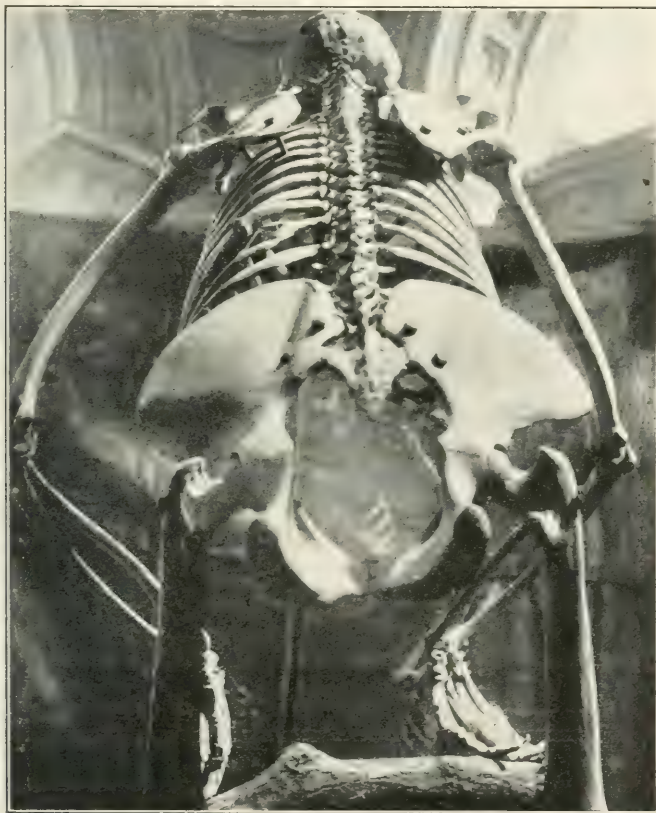


FIG. 11.—Adult female gorilla from behind and below to show the pelvic outlet. Note the short straight sacrum, the broad elongated ischial tuberosities, the lateral sweep of the iliac wings, and the expansive pelvic outlet. From a group in the Field Museum of Natural History.

sary to maintain balance in the upright position. Expansion of these wings is secured, however, at the expense of their strength. Fracture of the expanded alar surface of the human ilium is an easy and every-day occurrence, where it would be dynamically impossible in the ox (see Fig. 15), and difficult even in the lower



primates. These differences in the comparative architecture of the ilium are well shown in the accompanying photographs of the pelvis of the bison (see Fig. 16).\*. The alar portion of the haunch bone of the ungulates is a huge thick buttress projecting upward like a post; its unshapely mass gives no hint that it is the homologue of the light and graceful alar expansion of the human ilium. In most mammals except man and the highest



FIG. 12.—Group of male (upper figure) and female (lower figure) gorillas. From Field Museum of Natural History.

apes, and even in the lower primates, the thickened and undifferentiated dorsal part of the haunch bone tells the story of quadrupedality.

A similar process of lateral expansion with axial compression takes place also in the ventral two-fifths of the human pelvis in response to changed position and physiology. But while the changes in the dorsal pelvis just enumerated represent architecturally a distinct step upward, the changes about to be described are, with equal distinction, evidences of retrogression.

In man, with his shifted center of gravity, not only is the entire

\* See also Wiedersheim, *Structure of Man*, p. 75.



weight of the upper body transmitted as a compressing force to the thigh exclusively through the dorsal parts of the pelvis, with corresponding condensation and development of these parts, but the greater part of the function of support for the heavy viscera which is served by the ischiopubic arch of most mammals\* (see Fig. 17) is taken over by the human ilia and by the highly specialized abdominal muscles.



FIG. 13.—Pelves of swan (*Chenopsis atratus*, Lath.) and duck (*Merganser Am.*) Note ankylosed pelvis and absence of complete pubic arch. Note rudimentary hip-joint. From a Field Museum specimen.

This transfer of function explains the shallowness and lightness of the human pubic arch, which fulfils but three functions, none demanding great pressure resistance or massing of material:

1. Closure of the pelvic outlet; a function hardly calling for bone, and which in animals below mammals is admirably served

\* In lower mammals the ischium is apt to join the pubis in an *ischiopubic symphysis*, and even in other primates the pubic symphysis is longer than in man. In many mammals this articulation is of great length; for example, 7 inches in the adult elk, and in the buffalo 9 inches.

by membrane. In birds and other oviparæ the secondary importance of the pubic bones is shown by the fact that the ventral pelvic arch is not completed by bone, but by tendon and membrane of considerable tensile resistance. Stability and

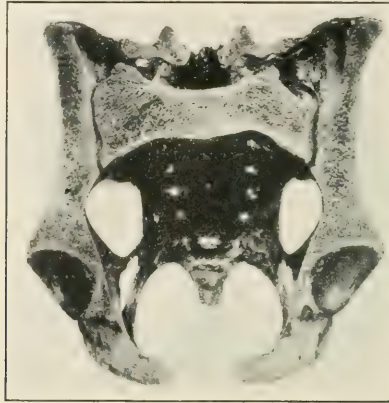


FIG. 14.—Transverse section of adult male human pelvis in true perpendicular axis of body. After Lesshaft.

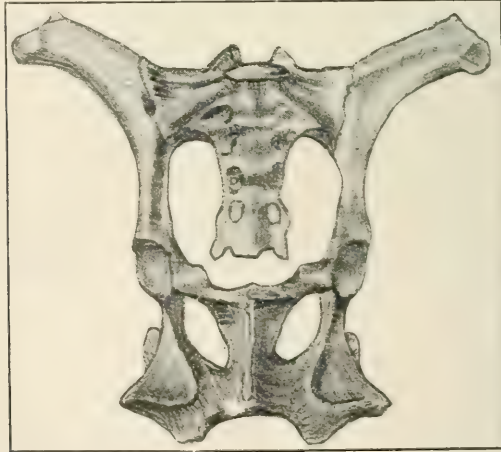


FIG. 15.—Pelvis of adult ox from below (ventral aspect). After McFadyean.

strength for flight and walking are easily secured by elongating and consolidating the sacrum and by uniting the innominates fixedly by bone to the sacrum and spine. This occurs, except in that great runner the African ostrich, without strengthening the pelvic circumference by a pubic arch (see Fig. 18).

The peculiar waddling gait of many birds is due to the elongated and ossified pelvis, plus a hip-joint in which the acetabulum is not only shallow and rudimentary but normally perforated (acetabular foramen). Those congenital dislocations of one or both hip-joints occurring in some human individuals with little or no acetabular cups are without doubt reversions to the avian type.

The usual lack of a complete pubic arch in animals below the viviparous mammal leads to the probably correct conclusion that a primary design of the osseous closure of the pelvic circle in mammals is to support the gravid uterus. We must therefore



FIG. 16.—Pelvis of buffalo. Axis somewhat-tilted as though animal had “reared up” into semi-erect position. From a Field Museum specimen.

include this duty as a part of that function of the mammalian pubic arch just enumerated. In the erect human pelvis, however, the gravid uterus receives as the result of a secondary pelvic development peculiar to man, a more generous support from the iliac wings and the iliopubic eminences. Again, therefore, the lightness and weakness of the symphysis and anterior two-fifths of the pelvic circle in the human species when compared with that of other mammals. In lower mammals the massive symphysis is much elongated and the ischia take part in the articulation; the hollowed-out ischiopubic arch of many quadrupeds

furnishes the greatest part of the support for the gravid uterus and for the filled rectum.\*

2. Adjustment and restraint during locomotion and parturition, and as a postaxial point of attachment for the abdominal muscles. These duties call for tensile strength such as is usually found in tendon rather than in bone.

We cannot ignore the important fact that without the support of the normal anterior arch the human gait becomes at once



FIG. 17.—Buffalo pelvis; from below to show ischio-pubic symphysis (ventral aspect). From a Field Museum specimen.

extremely difficult and awkward—a waddle strongly suggestive of the avian type of progression. That the maintenance of this arch is essential to comfortable human progression becomes obvious to the obstetrician who encounters cases where separation of the pubic symphysis has occurred during parturition. Such patients when attempting to walk for the first time after confinement discover that the hips “spread” with each step, and become painfully conscious of the sacroiliac and pubic articula-

\* Parturition is favored in some mammals (cat, sheep, dog, pig, etc.) by looseness and flexibility of the symphyseal joint. This fact is commended to the notice of obstetricians who contend that the symphysis of the parturient woman never opens.



tions. Pain is developed especially when changing from one foot to another and is localized at the pubes. The patient is made aware each time the body weight is thrown from hip to hip that the anterior arch is "sprung," and that the posterior arch "settles." The same phenomenon occurs in cases of ununited fractures of the pubic arch.

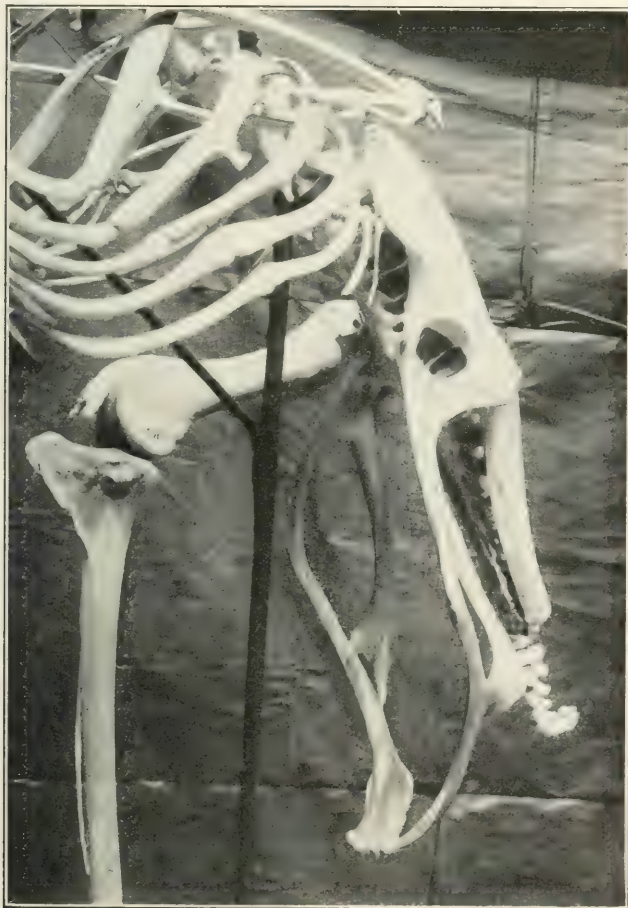


FIG. 18.—Pelvis of African ostrich (*Struthio camelus*). Note pubic symphysis and open acetabulum. From a Field Museum specimen.

These occurrences more than any others in pelvic pathology bring close to us the fact that the human pelvis is not an osseous unit, but a series of units held together with ligaments at elastic joints [by a nice adjustment of opposing but normally well-

balanced forces, brought together under the well-known mechanical principles of the arch. Closely associated with, and in fact inseparable from function 2 of the ventral arch is, therefore, function

3. Tensile support for the bases of the dorsal arch. The lateral thrust of the elliptical sacroiliac arch is restrained, and its greatest

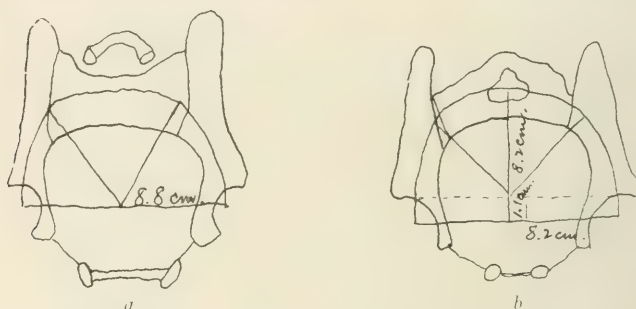


FIG. 19a.—Tracing of perpendicular section of human pelvis a little behind middle acetabula. Through dorsal arch of the 5th lumbar vertebra, body and lateral mass of first section of sacrum, sacro-iliac articulation, obturator membrane, ischio-pubic ramus, and triangular ligament. Note that the section of the arch is a circle.

FIG. 19b.—Tracing of section made at an angle of 40 deg. from perpendicular through dorsal arch and body and lateral mass of 1st sacral, cutting sacrum 2.4 cm. below promontory, showing strongest portion of ilium above the iliopectineal eminence. The section cuts the obturator membrane, the posterior pubic rami and the ligament of Henle. Note that the section of the arch is an ellipse.

strength developed, through being held tonically in a state of tension by the rigid chord or bowstring represented by the shallow pubic arch.\* In addition, the tension of the pubes is

\* As the result of a series of experiments which might almost be suspected of having been undertaken to establish an "argument from design" in certain details of pelvic architectonics, Lesshaft contends that all sections of the upper and dorsal part of the true pelvis of man are quite regularly elliptical, and that this portion can be demonstrated to have the shape and all the mechanical strength of a well-constructed dome. If a line drawn to connect the centers of the acetabula is bisected, the center of the line becomes the central point of the pelvic dome. From this point any horizontal radius to a circumference drawn through points of maximum bony strength averages 8.5 cm. Other radii erected in series from the central point gradually but symmetrically increase in length until one radius, averaging 9.6 cm., becomes perpendicular to the horizontal plane and passes through the midpoint of the body of the first sacral vertebra. If a section in the true perpendicular plane of the body is cut through the center of the acetabula, it will also cut the central bony point of the promontory; a curved line drawn through the densest bone lying between these points will demonstrate the elliptical construction of this part of the pelvis. A close study of the intimate structure of the bone in this vicinity demonstrates resistance planes similar to those found in the upper part of the femur. Lesshaft's diagrams also illustrate the character of the anterior or inferior arch, which strongly resembles the inverted truss frequently employed in bridge construction.

Two of Lesshaft's profiles are herewith reproduced—Fig. 19a and Fig. 19b (see also Fig. 14).

reinforced by the tonic contraction of the sacrosciatic ligaments. The use by nature of the principle of a supporting superior arch of heavy material with an inferior restraining chord of light weight but great tensile strength is not unique in this locality. The architectural device is employed in the arch of the foot, and, with somewhat modified form and meaning, in the ventral thorax.

From the foregoing the deduction is plain that the human pelvic arches serve different purposes; the primary function of the dorsal arch is resistance to pressure, that of the ventral arch resistance to tension. Since force acting as traumatism is usually manifested in terms of pressure rather than of tension, this also makes it clear why in 90 per cent. of pelvic accidents the pubic arch, whose greatest strength lies in the tensile resistance, is the sufferer.

When compared with the pelves of lower mammals the human posterior arch shows a remarkable development both in function and architecture. The anterior arch shows an equally distinct retrogression, not only in function but, as an anatomic corollary, in the quantity and strength of the material entering into its construction; mass and density have been sacrificed to tensile strength.

The foregoing study leads inevitably to the conclusion that function dictates to anatomy.

Phylogenetically the tendinous belly wall of the oviparous bird becomes the massive ischiopubic uterine support of the viviparous mammalian quadruped; this in turn, in the one completely erect primate, shrinks again into secondary importance as the pubic structure becomes merely an ossified chord or "tension member" inserted to restrain the lateral thrust of the sacroiliac arch.

The thick and shapeless haunch bone of the *Ungulates* becomes the light and gracefully expanded iliac wing of man.

The thin elongated sacral wedge of the quadruped becomes the broad basal support of the human spinal column, and hangs in turn as the inverted keystone of an arch perpendicularly upon the heavily buttressed ilium and acetabulum.

The sharp and projecting ischium, to which attach the rump muscles of lower mammals, is shortened and inverted to close the human pelvis, and provides the primate when seated with secondary points of support for the sacroiliac arch.

REPORT OF A CASE OF AN OVARIAN FIBROMYOMA  
UNDERGOING SARCOMATOUS DEGENERATION.\*

BY

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Philadelphia.

(With Two Illustrations.)

SOLID tumors of the ovary are far less frequent than cystic ovarian growths and form but a relatively small proportion of all ovarian neoplasms. Of the 488 ovarian tumors reported by Briggs and Walker,(1) there are but forty-nine solid new-growths or approximately 10 per cent. Of the malignant ovarian growths, carcinoma is more common than sarcoma. In the twenty-five malignant cases in Scharlieb's(2) series, there were only four sarcomata. In the sixty-three cases of ovarian growths reported by Norris,(3) ten of which were malignant, there was not a single case of sarcoma recorded. Of the malignant connective-tissue tumors, fibrosarcoma is occasionally met.

Most of the cases of fibrosarcomata of the ovary reported are of the spindle-cell type and began as primary sarcomata, the chief feature in these cases being a relative increase of fibrous tissue formation. No mention is made in any of these cases whether there existed a transformation or degeneration from the benign into the malignant form of growth.

Wiggin(4), in his report of a bilateral ovarian fibrosarcoma, mentions the comparative rarity of growths and notes that Schröder found but ten out of 600 and Olshausen twelve out of 293 ovarian growths. Handfield-Jones,(5) Riehm,(6) Goffe,(7) Vineberg,(8) Steele,(9) Rendenbach,(10) Michaelmann,(11) Bergerestain,(12) and Dartigues(13) each report a case of fibrosarcoma of the ovary.

Fibroma of the ovary, though more common than fibrosarcoma, still is rather an infrequent condition. In Scharlieb's(2) series of 150 consecutive cases of ovarian growths, there were three fibromata, one fibromyoma and four proved to be sarcomata.

In 934 cases of uterine myomata, Kelly and Cullen(14) encountered but three cases of fibroma of the ovary, in each one the tumor being unilateral.

\* Read before The Obstetrical Society of Philadelphia, March 7, 1912.



Peterson(15) collected eighty-two cases of fibroma of the ovary and reported two additional cases. In this series, he excluded those cases that were pronounced fibroma but subsequently caused death from metastases. The growths were described as fibromatous in sixty-three out of eighty-four cases, or in 75 per cent.; forty-eight of these were fibromata, twelve pure fibromata and one each of fibroma with colloid degeneration, fibroma with mucoid degeneration, and fibroma with hyaline and myxomatous changes, and there was one each accredited to the myomata and to the myofibromata with hyaline degeneration.

Sarcomatous change in uterine myomata is less commonly found than was at first believed. In Kelly and Cullen's(14) series of 1400 cases, but seventeen cases showed undoubted sarcomata of the uterus in, or associated with, myomata. They further note that in 409 myomata of the uterus reported by Fehling, 2 per cent. showed malignancy. Martin observed direct sarcomatous transformation four times in a series of 205 cases.

When taking into consideration the low percentage of malignant changes as encountered in the very common condition of uterine myomata, it is not at all surprising that but two cases of malignant changes have been noted in the rather relative infrequent incidence of ovarian fibromata. This is further emphasized by the fact that primary ovarian sarcomata of the fibroid type is also a comparatively rare condition.

Of ovarian fibromyomata undergoing sarcomatous degeneration or transformation, I can find but two instances on record:

Wolff(16) in 1895 reported the first case of a fibromyoma of the ovary undergoing sarcomatous degeneration. In a careful review of the literature prior to that time, he failed to find an instance of such condition. He also reviewed the literature of sarcoma of the ovary but could find no mention of one originating from a fibromyoma. The tumor reported by Wolff was removed from a patient sixty-six years of age, who had never been pregnant. It measured 21.5 by 12.5 by 11 cm. It was roughly divided into two lobes. It replaced the entire right ovary. The uterus and opposite ovary were normal, except for some adhesions enveloping the left appendages.

The second case was reported by Bushnell(17) in 1908. The patient was forty years of age. The tumor measured 13.5 by 12.5 by 9.5 cm., was encapsulated, rounded and weighed 1 1/2 pounds. It was lobulated and reticulated: no ovarian tissue was

discernible. It formed one of the sixteen cases of solid, or solid cystic, ovarian growths in his series. The case that I am about to report appears, therefore, the third to be recorded.

#### REPORT OF CASE.

The patient from whom this report is made was operated upon in the gynecological wards of the Jefferson Medical College Hospital, by Professor E. E. Montgomery, with whose kind permission this report is made possible. She presented the following interesting points in her history:

C. T., fifty-six years, white, housewife. Nativity, United States. History, No. 2217; Laboratory No. 5710.

Father died at seventy-two years of epithelioma of cheek, mother died at fifty-two years of carcinoma of the stomach.

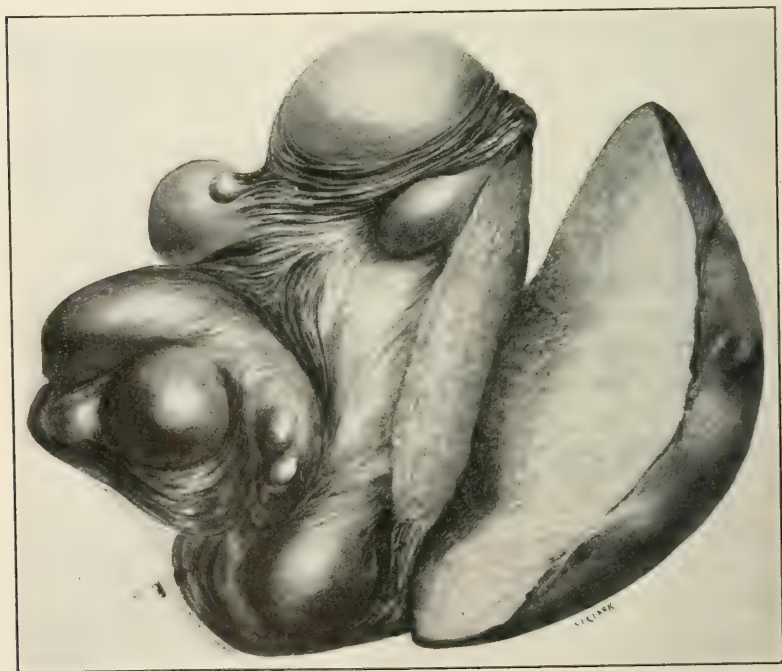


FIG. 1.—Ovarian fibroma with sarcomatous degeneration.

Health of patient was always good. Menstruation commenced at fourteen years, painful, irregular periods, ranging from two weeks to three months. Has been more regular since birth of first child, thirty-four years ago. Menopause four years ago. Twenty-six months ago, had vaginal bleeding, lasting seven days.

Had five labors two of which were instrumental, two of the children were still-born, had two abortions.

Four years ago noticed swelling of abdomen, same has continued until date. Abdomen has increased but slightly during past three months. Has gained in weight in past four years. At times is unable to urinate when in the sitting position. Physical examination reveals a well-nourished female of medium stature. Head, neck, thorax, lungs, and heart apparently normal. Abdomen is large, pendulous, overhangs upper border of pubes for 2 1/2 inches. A small umbilical hernia is present.

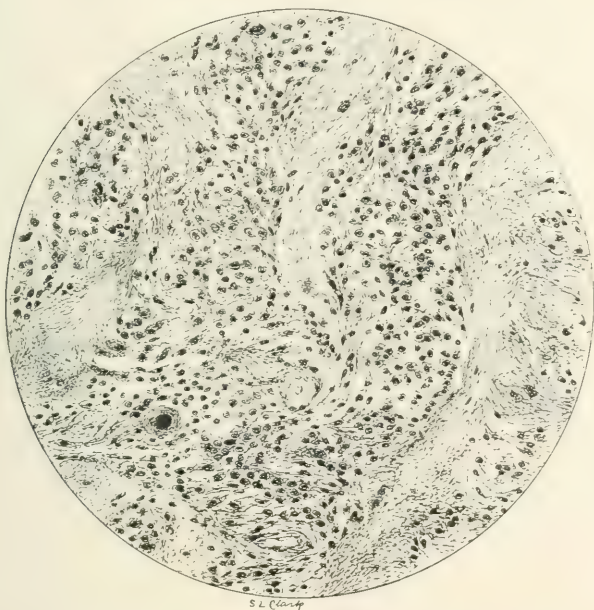


FIG. 2.—Ovarian fibroma with sarcomatous degeneration.

Palpation of abdomen reveals a smooth, firm mass which extends 3 inches above umbilicus in median line, outline of which is made out with difficulty as it approaches anterior-superior spine of ilium on right side, and mid-point of Poupart's ligament on the left. Bimanual examination shows pelvis to be filled with a firm smooth mass, uterus and cervix not palpable; pelvic floor and perineum greatly relaxed.

Operation Nov. 13, 1911. Abdomen opened by median incision and tumor cleared from slight adhesions to surrounding structures. The pedicle of the mass was attached to the right side of the uterus and the right broad ligament was narrow and soft and easily clamped. Ovary and tube on same side with tumor, not discernible. Uterus was soft, somewhat larger than normal; opposite tube and ovary were bound down by adhesions but showed no marked gross change. Patient made an unevent-

ful recovery and was discharged in good condition on Dec. 12, 1912, five weeks after operation.

*Gross Specimen.*—Is 25 by 25 by 18 cm., weighs 6 kilos 200 gm., 13 1/4 pounds. It is roughly divided into two lobes, one being three-fourths of specimen. The nodules are firm, red in color, grayish on section. Toward the end of the smaller is a calcified area 6 cm. in diameter. Between the main lobes is a kidney-shaped mass 10 by 5 by 3 cm., having properties similar to the others. Neither tube nor ovarian tissue discernible in the mass.

Portions of the large lobe (a), the small lobe (b), the soft pedunculated mass (c) and the kidney-shaped mass (d) were fixed in 10 per cent. formalin, embedded in paraffin and sections stained with hematoxylin and Van Giesen, and hematoxylin and eosin methods.

*Histological Description.*—Sections of the tumor show it to possess the usual structure of a fibromyoma for the most part; at points there are small areas of lime salts and the connective tissue has undergone extensive hyaline change. In certain areas, cells are numerous and are oval or round shape. They are closely placed, have prominent nuclei and some masses contain thin-walled blood-vessels.

*Pathological Diagnosis.*—Fibromyoma showing hyaline degeneration, calcareous infiltration and sarcomatous transformation.

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## THE USE OF THE CONTINUOUS FIXED LAPAROTOMY SPONGE.

BY

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(With One Illustration.)

THE adverse criticism to which one of my surgical friends has recently been subjected because a loose sponge was subsequently discovered in the abdomen of a patient on whom he had operated, brought this danger to my mind with unusual emphasis, and prompted me to present this subject.

We have done so much as a profession to improve our work and to protect the individuals who entrust themselves to our care, against errors of technic, that it is to be wondered at that some very definite stand has not been taken by surgeons to prevent the possibility of leaving sponges in the abdominal cavity,—a possibility that will always obtain so long as we use loose squares of gauze in our work.

We have all lived in more or less constant dread of this accident, I need but to mention the numerous cases of malpractice suits which it has inspired. We cannot blame the public for believing the accident a preventable one and yet, as the matter of sponges is usually handled in the average operating-room, it is quite remarkable that loose sponges are not closed up in the abdominal cavity oftener than they are.

When Dr. H. S. Crossen of St. Louis wrote an article which appeared in the AMER. JOUR. OBST. for January, 1909, on "Abdominal Surgery Without Detached Pads or Sponges," I was deeply impressed with the practicability of his suggestions, and immediately began to apply them. Since then—that is, for the last three years—I have entirely discarded the use of loose sponges from my abdominal work.

I now use long folds of gauze of desirable size which, for convenience and safety, are packed in bags. One end is stitched to the bottom of the bag; the other end is left free at the top. We thus have a continuous sponge which is pulled out little by little as required. Two sizes meet all requirements. A detailed description is given at the end of the paper.

It is a little difficult, at first, to become accustomed to the altered technic which the use of any new method involves; but one soon learns to use the continuous sponge rapidly and efficiently.

I use a laparotomy sheet containing three pockets, one on either side and one at the upper end of the opening in the sheet. In the upper pocket we fasten the bag containing the broader strip of gauze which is used for packing back the intestines or walling off local infective areas. In each side pocket we fasten one of the

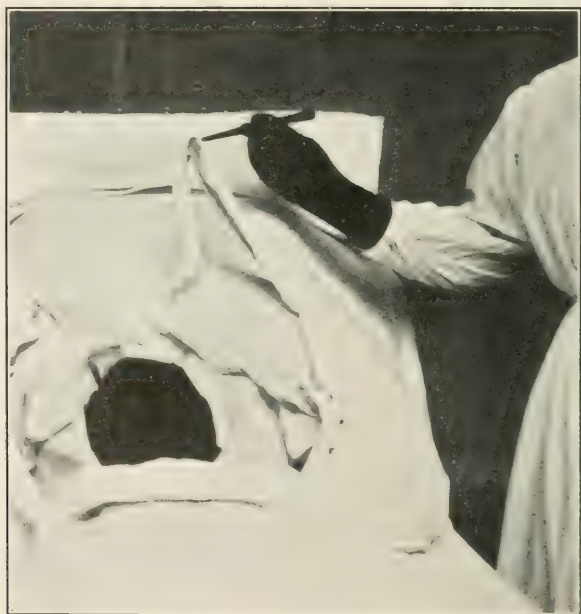


FIG. 1.—Showing laparotomy sheet in position. Wide sponge folded at top of opening ready for packing back intestines; a narrow fold in each side pocket ready for ordinary sponging.

narrower strips which is used by the operator and his assistant for keeping the field clear of blood or doing any work a sponge may be called upon to do. The pockets in the laparotomy sheet are a good deal wider than the sponge bag and the used-up part of the sponge is tucked away in the pocket of the sheet, leaving a clean portion of the strip always under the operator's fingers ready for use.

It is very important to keep the used-up part of the strip tucked away in the pocket or otherwise the sponge will be getting

tangled up with everything around the field of operation. After using these continuous sponges a few times, this part of the technic becomes almost automatic. Dr. Crossen in his article, does not suggest the use of pockets for the sponge bags but simply pins the bag to the side of the sheet and allows the used-up part of the sponge to keep dropping to the floor. I think the use of pockets permits a better technic.

We rarely find it necessary, in an ordinary laparotomy, to use more than the three sponges with which we started. Should the operation be an unusually long one, however, or should hemorrhage be unusually troublesome, we are likely to require two additional sponges which are always in readiness.

Should an abscess be opened or any infective fluid be spilled in the abdomen or pelvis, one of the sponges is used to wipe it clear and then discarded, another pocket with contained sponge being pinned or clamped to the sheet over the original pocket, thus covering up the whole infected area.

When troublesome oozing occurs, which demands the use of a temporary hot sponge pack, a sponge bag is pinned to the laparotomy sheet below the incision, and as much as is required is pulled out, wrung out of hot salt solution, and packed in the pelvis.

I am thoroughly satisfied with the use of these sponges. I find them easy to use, safe, and economical. They can be employed over and over again. Some of those we are using now are the original ones that were made three years ago. They are washed out after each operation, bleached, dried, repacked in their respective bags, and resterilized.

A number of surgeons throughout the country have used the continuous laparotomy sponge a sufficient length of time to prove conclusively that abdominal operations can be efficiently performed without the use of the dangerous loose sponge. This being so, it follows logically that as time goes on, and the knowledge of this fact becomes more widespread, the surgeon will find it increasingly difficult to obtain in courts of law, extenuation for having left a sponge in the abdominal cavity.

Each set of sponges for abdominal section consists of four narrow strips and one wide strip.

Each narrow strip consists of a piece of gauze 10 yards long and  $1\frac{1}{2}$  yard wide, folded lengthwise so as to make six thicknesses. The strip when finished is 3 inches wide and 10 yards long with

all the raw edges turned in and the ends stitched to keep it from unfolding. The strip is then ready for the bag which is made of very heavy muslin sewed with French seams (to prevent raveling) and when finished is 5 inches wide and 10 inches deep. The bag is then turned inside out and one end of the strip sewn securely to the seam at the bottom of the bag. It is then turned right side out again and the strip is packed back and forth into the bag a little at a time, so that it will pull out easily when used. The bag is then closed with one strong safety pin which is used later for fastening the sponge to the pocket of the laparotomy sheet.

The wide strip consists of a piece of gauze 1 yard wide and 5 yards long folded lengthwise so as to make four thicknesses. When finished it is 9 inches wide and 5 yards long with ends stitched the same as the narrow strips. The bag for the wide strip is 10 inches wide and 6 inches deep sewed with French seams. The strip is then fastened to the bottom of the bag and packed into it and closed in the same way as the narrow strip.

Each laparotomy sheet is made with three pockets—one at each side 12 by 12 inches—and one at the head of the sheet 12 by 8 inches. At the beginning of an operation, one narrow strip is placed in each side pocket and pinned to the pocket with the safety pin which closes the bag containing the strip. The wide strip is placed in the pocket at the head of the sheet in the same way. The narrow strips are used dry but the wide strip is dampened with hot salt solution before it is placed in the pocket.

Each set of abdominal section sponges has a separate set of pockets and when fresh sponges are necessary, the soiled sponges and pockets are covered with a fresh pocket containing a fresh sponge.



THE TORSION OF TUBAL ENLARGEMENTS WITH  
ESPECIAL REFERENCE TO PYOSALPINX.BY  
BROOKE M. ANSPACH, M. D.,  
Philadelphia.

(With Seventeen Illustrations.)

THE patient who drew my attention to the subject of this paper was admitted to the University Hospital on the sixteenth of May, 1910. She was an unmarried woman, twenty-six years old. Her history was negative, except that during the year previous she had suffered three attacks of sharp pain in the right side of the lower abdomen, which her physician had attributed to appendicitis. The present attack had come on acutely, and was accompanied with fever, rapid pulse, nausea, and constipation. The entire lower abdomen was tender and rigid, but particularly so on the right side around McBurney's point. There was slight tympanites and some limitation of peristalsis. Pelvic examination was unsatisfactory, because no relaxation of the abdominal walls could be obtained, and the vaginal introitus was narrow.

A diagnosis of acute appendicitis was made, and immediate operation advised. Under the anesthetic an area of induration could be felt in the right iliac fossa. When the peritoneal cavity was opened, a small amount of blood-stained serum escaped, and upon introducing the finger, a mass could be felt at the brim of the pelvis. After isolating the area with gauze and exposing it with retractors, an oblong body, purplish-black in color, could be seen, which at first suggested a strangulated coil of small intestine. Upon further examination, it proved to be the tube and ovary of the right side which had undergone torsion. The mass was but lightly adherent to the surrounding intestine and omentum. The tube was distended with pus, and formed the bulk of the enlargement. The ovary was closely adherent to the tube, slightly increased in size, and infiltrated with blood. The tubal mass was twisted upon itself in the direction of the hands of a watch about one and three-quarter times. The pedicle was made up of the broad ligament, the uteroovarian ligament, and the inner extremity of the tube. The appendix was adherent at the tip, but appeared to have been in-

volved secondarily. The right tube and ovary, and the appendix were removed. The peritoneal cavity was drained, and the patient made an uncomplicated recovery.\*

I was much interested in the case because I had never seen one like it, nor had I read much on the subject. A sactosalpinx containing pus and twisted seemed extraordinary because as a rule there would be sufficient attachment to its surrounding structures, to prevent such an accident as torsion.

There was no history of gonorrhea and no evidence of a gonor-

\*The pathological report of the specimen is as follows:

*Macroscopic Description.*—The specimen consists of the right tube and ovary, and the vermiform appendix.

*Right Tube.*—Measures about 14.5 cm. in length. It is retort-shaped. The diameter at the uterine extremity is 8 mm.; through the middle of the isthmus, 1.5 cm.; from here the tube widens out rapidly, until through the ampulla the diameter is 5.5 cm. The abdominal ostium is constricted so that a small probe can be passed only with difficulty. Numerous fimbriae are present externally. These are greatly enlarged and are all deeply congested. One of these measures 5 cm. in length. The surface of the tube is free of adhesions, except on the posterior portion of the isthmus. The entire specimen is deeply congested, reddish-black in color, and shows the result of an acute torsion. This has been in the direction of the hands of a watch, and can be easily reproduced. At the area of torsion, the tissues are black. The lumen of the tube is much dilated, and contains thin yellow pus streaked with blood. The mesosalpinx is thickened and infiltrated with blood. The pedicle has been formed by the inner third of the tube and the mesosalpinx.

*Right Ovary.*—Is involved to a considerably less extent. It measures  $5.5 \times 3 \times 1.5$  cm. The surface is covered with vascular adhesions. The substance of the organ is comparatively normal.

*Appendix.*—Is 4 cm. in length. Beyond a few adhesions, it appears normal on the surface. On section, the lumen is slightly dilated.

*Histological Description:*

*Right Tube.*—The walls are edematous and infiltrated with free blood and serum. The blood-vessels are engorged, and some contain thrombi. Here and there, areas of small round cell infiltration are seen. The epithelial elements of the mucosa have disappeared, apparently as the result of a suppurative process and a dense infiltration of blood.

*Appendix.*—Presents the usual appearance of a chronic appendicitis.

*Diagnosis.*—Right purulent salpingitis (acute torsion). Right chronic universal oophoritis (hemorrhagic infiltration as the result of torsion).

*Macroscopic Description.*—The specimen consists of the left tube. This measures 17 cm. in length. The proximal 3.5 cm. is normal in diameter. From this point it gradually widens out until through the ampulla it attains a thickness of nearly 3 cm. The organ is typically retort shaped. The abdominal ostium is closed, but most of the fimbria project from the outer extremity. The walls of the outer portion of the tube are thin (average thickness 2.5 to 3 mm.). The lumen is dilated and contains thick, creamy pus. The color in the enlarged portion of the specimen is yellowish-white. The general character of the tube and the luxuriant fimbriae are suggestive of tuberculosis. The mesosalpinx is thin. The general shape of the specimen is that of a hydro rather than a pyosalpinx.

*Histological Description.*—The surface presents adhesions. The muscularis is thin, fibrous, and infiltrated with small round cells. The mucosa is flattened out against the muscularis. The plica as such have been almost totally obliterated. The surface epithelium is desquamated. A number of small gland-like spaces are present, the epithelium of which is irregular, and for the most part, stains deeply. The stroma is infiltrated with inflammatory products, and here and there typical tubercles are observed. One or two giant cells are present. Re-examination of the specimen previously removed (right tube and ovary), fails to show any evidence of tuberculosis.

rheal infection upon careful examination. I concluded that the tube very likely was a tuberculous one, in which the inflammatory alterations had been subacute in character, and had caused considerable enlargement without much surrounding infiltration or adhesions. Nevertheless, a careful histological examination of the tube wall did not reveal the characteristics of a tuberculous salpingitis. No cultures were made.

The patient went home after the usual period of convalescence, but returned about the first of January, 1912, nearly two years later, complaining that at each monthly period the incision would open and discharge a slight amount of bloody fluid. I concluded from this history, and from an examination, that there was a fistulous communication between the right uterine cornu and the incision, evidently the remnants of the drainage tract. The left ovary was prolapsed and adherent. I recommended an operation for the closure of the fistula and the release of the left ovary.

After a median abdominal incision, the fistulous tract was excised from the uterus at one extremity, and ligated immediately beneath the previous scar at the other. Attention was then given to the opposite side of the pelvis: the tube presented an appearance at once suggesting a tuberculous pyosalpinx, was of unusual length and had an abnormally redundant mesosalpinx. It was perfectly free and floating, so to speak, on the left side of the pelvis, and had escaped my observation entirely in the pelvic examination. The tube was removed, the ovary released from its adhesions, and suspended. Histologic examination showed that the enlargement of the tube was due to tuberculosis.

This specimen, I believe, showed precisely what the condition of the right tube was before torsion took place, and exhibits the factors predisposing to torsion on that side, viz., the unusual length of the tube, the very considerable enlargement which was limited almost entirely to the outer third, and the absence of adhesions. Probably the only difference in the two sides originally lay in the ovaries; the right ovary, presumably, was not adherent previous to the torsion; the left ovary was fixed to the posterior surface of the broad ligament.

On searching the literature, I found that torsion of tubal enlargements had received a considerable amount of attention. A number of monographs have appeared, notably those of Praeger, Cathelin, and Bell. A considerable number of

references to the subject were not accessible, but I was able to find and review eighty-seven cases.

As might be supposed, the reports vary in completeness and exactness, so that an accurate and comparative study of them is not possible in every particular. Nevertheless, there are certain facts of clinical importance to which I ask your attention.

*Anatomical Diagnosis.*—Under the title of this paper have been grouped the cases of torsion following tubal enlargements, whatever their nature; but no instance of a twisted tube (whether diseased or normal) in which it formed but a part of the pedicle of another tumor which had become twisted, has been included. A very large majority, or sixty-two of the tumors were described as hydrosalpinx or hematosalpinx, the latter being secondary, engrafted upon the first, and the result of torsion in most instances. In two cases reported by Chaput, the hematosalpinx was primary and associated with gynatresia.

In five, the tube was the seat of an ectopic pregnancy; in two, it was enlarged by a new growth; in two, there was a cystic tumor of the outer extremity of the tube (not of the parovarium), and in twelve, there was a pyosalpinx, or the blood of an hematosalpinx was mixed with pus. The enormous size to which these tubal accumulations may grow, is evidenced by the dimensions 20 cm.  $\times$  6 cm. of one of the tumors, and by the contents (4 liters) of another case; others contained from 80 to 500 gm. of blood-stained fluid.

*Clinical Diagnosis.*—It is not at all surprising that none of the cases were correctly diagnosed before operation, because the condition is rare and there are no specific indications. The acute nature of the attack with fever, leukocytosis, localized rigidity and tenderness, led to the diagnosis of acute appendicitis in eight cases. In twenty-five, an abdominal or pelvic enlargement, plus the acute pain and the absence of evident inflammatory symptoms, made an ovarian cyst with a twisted pedicle, the probability. In four cases a tubal pregnancy was regarded as the offending cause, and in twenty, pelvic inflammatory trouble of some sort was expected. In two cases, gynatresia, with distention of the vagina and uterus was diagnosed. The diagnosis in one case was acute strangulation of the intestine. In thirty, no clinical diagnosis is given.

*Period of Observation.*—Most of this series of cases were operated on after the symptoms had existed for some time. A very common history is that the patients complained for a greater



or lesser period of distress in the affected area, or repeated attacks of severe pain, while the particular attack for which they sought hospital or surgical treatment, was the most violent.

A majority of them were kept under observation for a while, possibly in view of the doubt as to what they actually represented, and partly in the hope of resorting to operation at a later and more favorable stage of the disease. Fifty-six were operated on after more than two weeks' observation and in some, the painful paroxysms had extended over a much longer

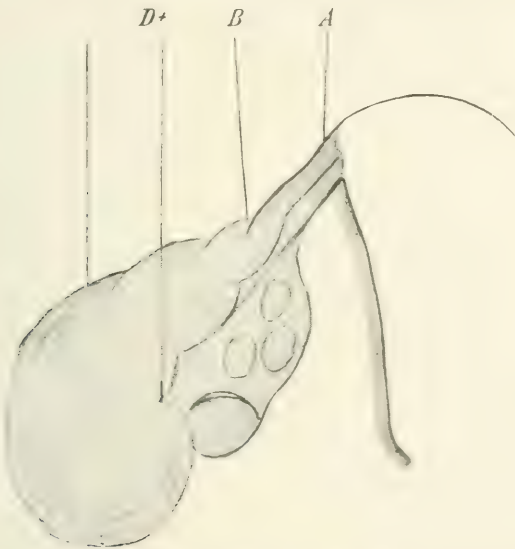


FIG. 1.—Beginning of the hydrosalpinx with inversion and healing of the fimbriated end. (After Funke.)

time, as long as three months in one instance. In nine the operations were performed immediately, or within thirty-six hours, in ten, within two weeks of the onset of symptoms.

*Abdominal Tumor.*—Although no mention is made in thirty-nine of the case reports whether an abdominal tumor was present in twenty-two it is said, that an abdominal enlargement was not observed. Undoubtedly, most of the thirty-nine cases, in which no mention was made, did not exhibit an abdominal enlargement. Nevertheless, in thirty-four, it is definitely stated that an abdominal enlargement was present. Excluding four cases in which the tumor was due to an associated condition, such as fibroid of the uterus and hematometra, there were thirty, or nearly a third, in which the twisted tube

was so large, or placed so high, that it could be palpated or observed upon abdominal examination.

*Side Affected.*—There is a great predisposition for torsion to occur on the right side; in forty-nine cases, or more than one-half, torsion of the right tube alone was present; in thirty-one, the left tube was affected; in seven, both sides were involved. No statement is made in eight. Why torsion more frequently affects right than left tubal enlargements, affords interesting ground for speculation. It may be that the greater roominess

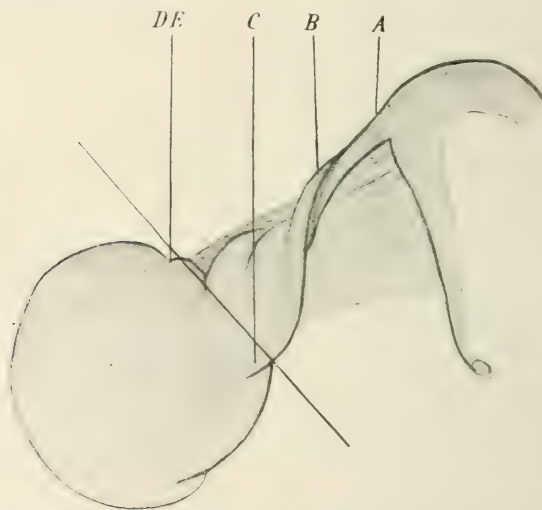


FIG. 2.—Twisting of the hydrosalpinx in the direction of the hands of a watch.  
(After Funke.)

of the right side, the left side being partly filled up by the sigmoid flexure, may have something to do with it, especially in those cases in which there are no adhesions, the tumor is bulbous in shape and has a long mesosalpinx.

In those cases with primary adhesions, and there must of course be some, the peristaltic action of an adherent loop of intestine might have some direct influence, as has been suggested by Woolcombe. The peristaltic action of the cecum, or the small intestine to which a hydrosalpinx on the right would likely find attachment, would be greater, possibly, than that of the sigmoid on the left.

As there is a source of infection on the right side of the pelvis, which does not exist on the left, viz., the appendix, the question

arises whether that organ may not be responsible for the original infection of the tube in some cases. This also would favor the preponderance of right-sided hydrosalpinx. Unfortunately, the condition of the appendix was not noted in a large majority of the reports.

*The Appearance of the Tumor upon Abdominal Section.*—A great number of the cases upon exposure through the abdominal incision presented a purplish-red or bluish-black mass, at once suggesting a strangulated cyst or a coil of intestine. Sixty-six



FIG. 3.—Showing the inclination of the female pelvis in the erect position. The difference of inclination in the recumbent and the erect position would favor rotation of a hydrosalpinx lying on the pelvic brim. (Cathelin.)

were of this appearance; the degree of circulatory disturbance was sufficient to cause gangrene in a number of cases. In five, the contents were clear, and the condition had not advanced to the point of such obstruction to the circulation as to cause hemorrhage or necrosis. In two cases of pyosalpinx, the tumor had a yellowish color, one of the cases suggesting a dermoid cyst. Nothing is said and no inference can be drawn concerning the color or appearance of the tumor in eleven instances.

*The Number and the Direction of the Twists.*—The number of

twists varied from one-half to four or more; in a majority of the cases (twenty-three) there were two twists; in twenty-five, no information can be gleaned upon the subject. The direction of the twists is not stated in fifty-nine of the cases, and of the remainder, it is put down as to the right in six; to the left in six; as the hands of a watch move in twelve; and contrary to the hands of a watch in sixteen.

*Condition of the Ovary of the Affected Side.*—Nothing is said of the ovary in thirty-four; it was involved in twenty-seven and uninvolved in thirty-four. The only deduction from this is that the participation of the ovary of the affected side is accidental, and occurred in about a third of the cases.

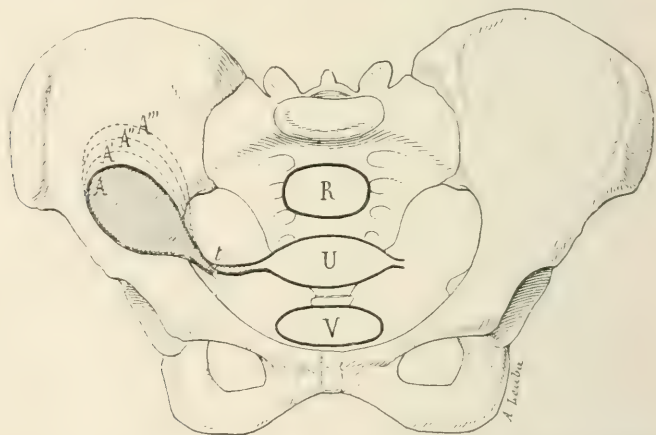


FIG. 4.—Showing gradual enlargement of the hydrosalpinx and point *t*, where torsion is most likely to occur. (Cathelin.)

*Condition of the Opposite Adnexa.*—The adnexa on the opposite side were healthy in twenty and diseased in forty-four instances. In thirty-one no statement is made. Involvement of the opposite tube and ovary to this extent, *i.e.*, nearly a half of the cases, would correspond to the usual bilateral involvement in pelvic infection.

*Age, Social Condition, and Parity.*—Although the incidence of cases with respect to age, corresponded closely with the periods of the greatest physiological development and function of the generative tract, more than one-third of the patients were under thirty years, and eleven were under twenty. Thirteen of the total number, also, were unmarried or virginal. Of the remainder, only forty-four are clearly said to have been married, or have



been placed among the married ones because of the history of pregnancy. It is definitely stated that twenty-seven of the patients never had been pregnant, while in thirty-eight, pregnancy had occurred.

*Etiological Factors in Torsion of Tubal Enlargements.*—The normal Fallopian tube is of such size and structure that strangulation by torsion is almost inconceivable; when, however, the outer part of the tube becomes enlarged or heavy, and at the same time is not adherent to surrounding parts, the mechanical conditions favoring torsion may be said to exist, viz., a freely movable tumor (the enlarged ampulla of the tube) attached to a more or less fixed base (the uterus) by a pedicle (the isthmus)

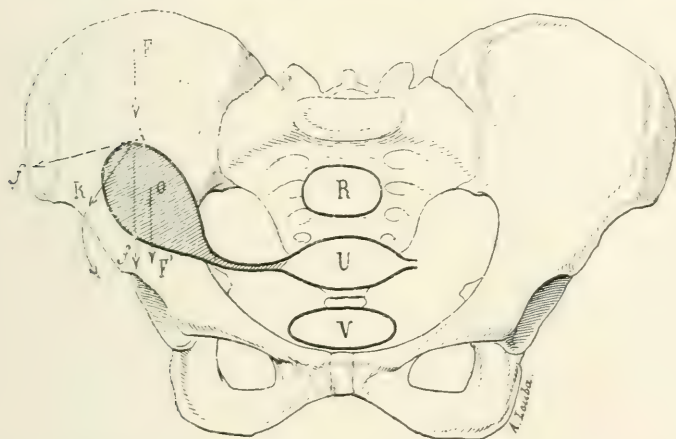


FIG. 5.—Forces entering into the torsion of a hydrosalpinx. The force representing the weight of the intestines is illustrated as active at A; the force of gravity at O. (After Cathelin.)

of the tube and the mesosalpinx). Under such circumstances, the same forces which cause torsion of ovarian or parovarian tumors, may come with play, with a similar result.

Although several cases are reported in the literature as examples of torsion of normal tubes, a perusal of the articles, describing them, will show that there existed at the time of operation, inflammatory bands or adhesions, or some other evidence of past disease. It would be impossible to deny, therefore, that at the time of torsion, the tube had been the seat of a hydrosalpinx, that, in the course of years, the fluid had been absorbed and the thinned-out walls of the tube had undergone atrophy.

In other instances one cannot help wondering why the author has reported the case under such a title, for both the history and the pathologic anatomy of the parts at operation, indicate clearly that the tube was previously diseased. In von Graff's case, an illustration of which is here exhibited, there was probably a congenital defect, or it is possible that adhesions may have so compressed the isthmus of the tube as to result in atrophy and atresia. It is unlikely that the normal tube ever undergoes torsion, although a tube may be predisposed to it by reason of an abnormally long mesosalpinx, or by one or two accessory ostia, or by greater length and thickness than usual.

Given the mechanical conditions favoring torsion, the exciting causes are the same as those given for ovarian cysts.\* In addition, another cause more or less recently developed by Payr ("Ueber die Ursachen der Stieldrehung intraperitoneal gelegener Organe," *Archiv. f. klin. Chir.*, lxxviii, 1902, p. 501; "Weitere experimentelle und klinische Beiträge zur Frage der Stieldrehung intraperitonealler Organe und Geschwülste," *Deuts. Zeits. f. Chirurg.*, lxxxv, 1906, p. 392), must be given a place.

Payr found that venous stasis in the pedicle of a small, freely movable tumor, led to torsion. The sort of a pedicle to which his experiments would seem especially to apply, is just such a one as would be found in enlargements of the tube, the hydrosalpinx, or other tumors being freely movable and largely confined to the outer parts. When the veins in such a pedicle become engorged, having a more spiral course and stretching more than the arteries, they impart a twisting motion to the pedicle, as is well illustrated by Payr. Should the twist become sufficient to cause more obstruction to the circulation, the distention of the veins becomes even greater, and the torsion is increased.

This may explain the apparent fact that torsion of adnexal

\* Storer mentions as exciting causes of torsion of ovarian cysts:

Disturbances in the equilibrium of the tumor itself, by reason of irregular growth.

Pregnancy from fetal movements, or displacement of the tumor by the growing uterus; contractions of uterus during labor, or the sudden diminution in pelvic contents at the close of labor.

Alternate distention and evacuation of the bladder.

Defecation, descent of feces into rectum, or strain during the act.

Intestinal peristalsis, possibly impotent, unless adhesions are present.

Unusual, sudden, or constrained movements of the body as a whole; vomiting, stooping, twist of body in getting out of bed, etc.

Trauma, tapping, fall, jolting, pressure of wash-tub against abdomen, plus up and down movements, administration of enema, gynecological examinations.

tumors, of whatever nature, is often precipitated by pregnancy, or by rapidly growing tumors of the uterus; the pressure of the uterus on the pedicle causing congestion of its veins, and at least starting the twist. Damianos ("Ueber die Stieldrehung der Adnexe in Leistenbrüchen im frühen Kindesalter," *Deuts. Zeits. f. Chir.*, lxxx, 1905, p. 228) thinks that Payr's theory applies to the torsion so often observed in the adnexal inguinal hernias in children. He reports fifteen cases from the literature, and one of his own.

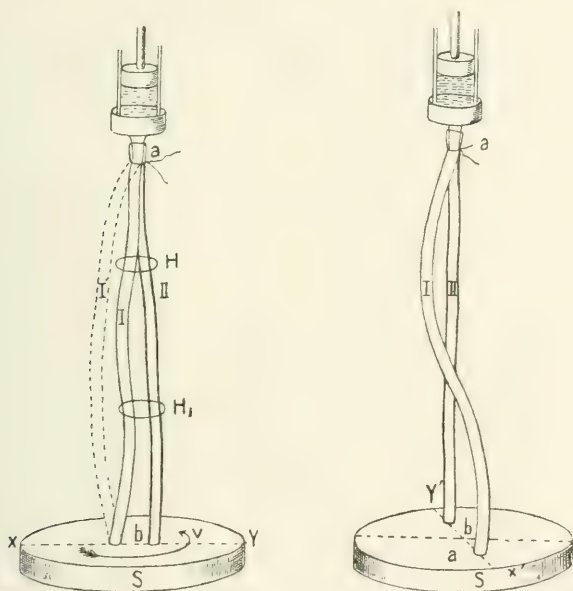


FIG. 6.—Experiment illustrating the effect of increased pressure on the veins of a pedicle. S, disc to which are attached two tubes, I and II. I is thin walled and represents the vein; II is thick walled and represents the artery. II is filled with air or water and closed at both ends. I is injected with water under pressure. This results in elongation and distention of the thin tube and a twisting of the disc as shown in the second figure. (After Payr.)

*Hydrosalpinx*.—It must be true that a great majority of the enlargements of the tube which undergo torsion, are of an inflammatory nature. This statement is borne out by the pathological anatomy of the parts, found at operation, and by the condition of the opposite adnexa. The form of the enlargement is that known as hydrosalpinx, and in the course of torsion it almost always becomes converted into an hematosalpinx. Many of these hematosalpinxes have been taken as evidences of

tubal pregnancy, as mentioned by Fritsch, Sanger, and others. After microscopical examination of specimens came into vogue, it was demonstrated that some of the supposed tubal pregnancies were strangulated hydrosalpinxes.

In many of the cases of hydrosalpinx which undergo torsion, there is no history of an infection of the common sort, viz., that due to gonorrhea or to puerperal infection. Thus in the series of cases which I have collected, from the statements of the authors or the deductions to be drawn from their reports,

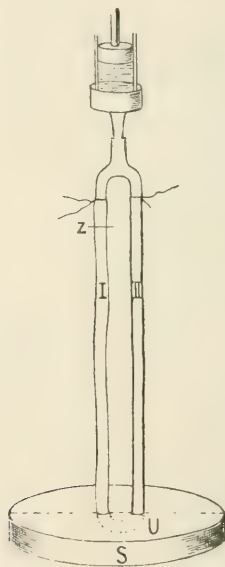


FIG. 7.—The twisting of the disc and tube will occur just the same if they are connected below U and both subjected to the same increase of pressure by attaching the upper ends to a Y-tube. The tube I is ligated at Z. The twisting of the disc will occur as a consequence of the disproportionate increase in length and diameter of I. (After Payr.)

a hydrosalpinx had formed in thirty-two instances with no history of a previous pelvic infection, or any of the possibilities thereof. While in many such a history might have been elicited by careful inquiry, it nevertheless must be true that in some there was no explanation for the tubal disease on the grounds of a primary genital or pelvic infection.

We may ask, therefore, what is the source of a hydrosalpinx in an unmarried and virginal woman? Findley ("Gonorrhea in Children," *Western Med. Rev.*, April, 1912, p. 186), Sanger (quoted by Sarah Welt-Kakels) ("Vulvovaginitis in Little



Girls, a clinical study of 190 cases," *N. Y. and Phila. Med. Jour.*, Oct. 8, 1904), Marx ("Salpingoovarites à la suite de vulvovaginite chez les enfants, traitement prophylactique," *Gaz. de Gyn.*, Nov. 15, 1895) and others have observed that gonorrheal vulvovaginitis in childhood may persist in a latent form until puberty, and then invade the uterus and tubes without producing symptoms which lead to a correct diagnosis, the pain, etc., being ascribed to extragenital conditions, and the previous infection forgotten.

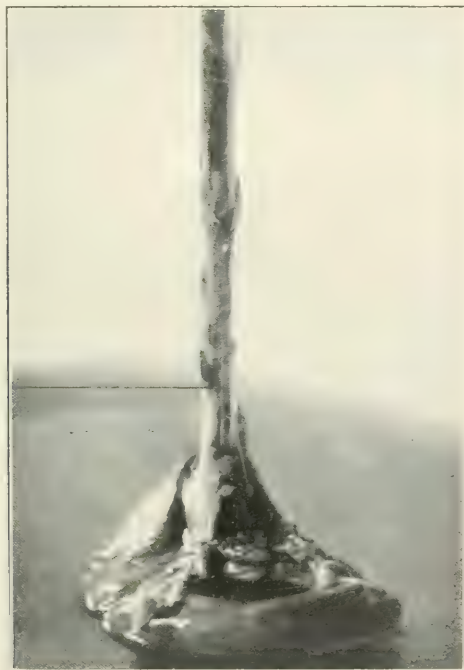


FIG. 8.—Spleen suspended by its vessels and resting on water, before injection of veins. (Payr.)

It is also possible that a hydrosalpinx may form as the result of a salpingitis, dating from childhood or young womanhood, the lesion taking place in the course of febrile, especially exanthematous diseases, and little note being made of lower abdominal or pelvic symptoms, because of the patient's age.

A case of Funke is interesting in this connection. A virgin, twenty-eight years old, had suffered with "typhus" at twenty. The operation was performed at twenty-eight, when the tube

of each side had been converted into a hydrosalpinx, and both were twisted. Hennig (*Zent. f. Gyn.* No. 31, p. 729, 1893) found in the autopsy of a young girl after "typhus," a hemorrhagic necrosis of the tube, with perforation into the bowel and into the bladder.

It is also possible that tuberculosis may be responsible, in some cases of hydrosalpinx, as it will be shown later, is true for most of the pyosalpinxes which become twisted. Delore



FIG. 9.—Same organ as Fig. 8 after injection of veins: showing a twist of  $125^{\circ}$ . (Payr.)

and Alamartine (see abstract) have reported a case in which they suspected such an infection. The patient was a virgin of thirty-eight; there was no history of pelvic disease, although the ends of both tubes were closed, and the right, which was a very large hydrosalpinx, contained  $1\frac{1}{2}$  liter of fluid; it was twisted on its pedicle two or three times, but strangulation had not occurred; the fluid was clear yellow, and the tubal walls were thin and transparent. The authors, in report-

ing this case, bring up the question of tuberculosis being a cause of hydrosalpinx, and say "in view of the frequency of genital tuberculosis apparently increasing from day to day, it seems not illogical to ask if hydrosalpinx is not sometimes symptomatic of an attenuated tuberculous infection, as is the case, for example, with hydrocele." They injected some of the fluid from their case into a guinea-pig, but there is no report of the result.



FIG. 10.—Spleen before injection. (Payr.)

*Pyosalpinx*.—While the torsion of a hydrosalpinx is not extremely rare, the opposite is true of pyosalpinx, because such prerequisites as free mobility of the tubal enlargement and a mesosalpinx sufficiently long to form a pedicle, do not obtain. Altogether, there are only a few cases of twisted pyosalpinx in the literature, and most of them, other authors have denied as being primary, believing that they were originally hydrohematosalpinxes which had become infected secondarily. Nevertheless, there are some undoubted cases in which a primary pyosalpinx became twisted.

The ordinary pyosalpinx is fixed to surrounding parts and it would be impossible for it to undergo torsion. As the in-

flammation subsides and the pus is absorbed, in a certain proportion of cases, the pyosalpinx becomes converted into a hydrosalpinx. Undoubtedly, some of the cases of twisted hydrosalpinx have this history. The point I wish to make however, is that the primary pyosalpinx which undergoes torsion, must differ from the ordinary gonorrheal or septic form in an absence of adhesions and surrounding inflammatory exudate.

Taking the cases in the literature described as twisted pyosalpinx, and adding my own case, there are twelve altogether:

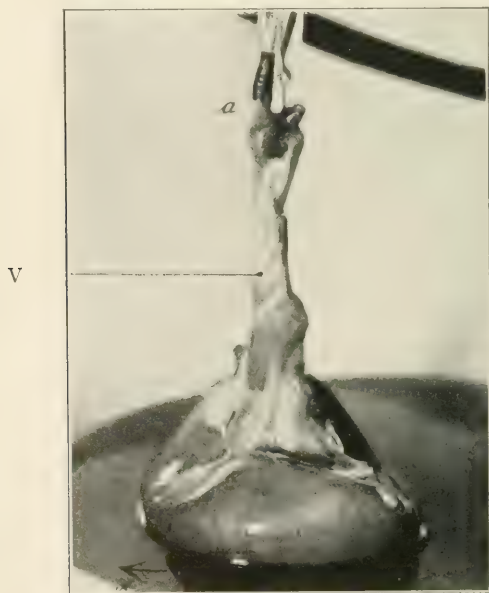


FIG. 11.—Same spleen as Fig. 10 after injection: showing a twist of  $100^{\circ}$ . (Payr.)

Analyzing them, we find that two (Ross' and Merdervoort's) are definitely stated to have been tuberculous; in one (Lewers'), tuberculosis was thought likely by the author, sepsis and gonorrhea being fairly well excluded; in two (Fränkel's, Woolcombe's), no bacteriological or histological evidence of the tubercle bacillus was found, but from the proceeding history and the gross pathology, tuberculosis was at least quite possible.

Of the remaining cases, one (Pierson's) is so incompletely reported, that no conclusion is justifiable; in one (Jacob's), the case was unquestionably an ordinary pyogenic infection, but



the tube is merely said to have been twisted and it is of secondary interest, as it was associated with a fibroid tumor of the uterus and an ovarian abscess, the specimen being recovered after vaginal morcellement of the fibroid and vaginal hysterectomy.

In one (Rouffart's (I)) case, the existence of torsion is very doubtful, and the number of twists is not stated; it is said that the fimbriated extremity of the tube was carried to the median line and that the posterior surface of the tube was adherent to the anterior surface of the uterus, the uterus being in retro-

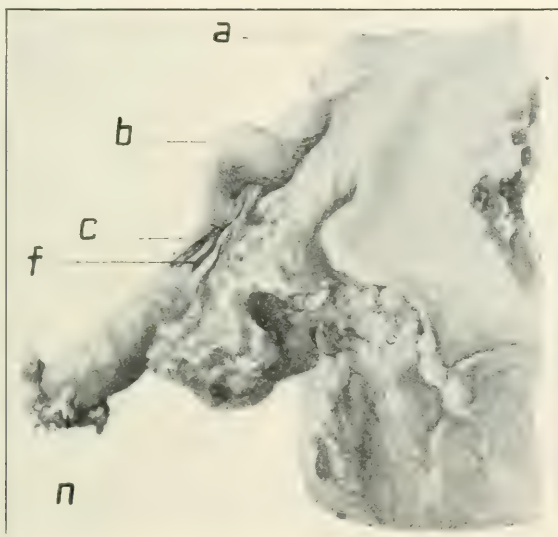


FIG. 12.—Von Graff's case of torsion and atresia of a tube, not the seat of an enlargement. Anterior view.

position. In one (Pozzi's (I)), the infection probably originated in the appendix. In one (Pozzi's (II)), there were possibilities of infection (three children, one placenta previa, and the history of metritis). Six years before admission, pus was evacuated from the left iliac region by a subperitoneal laparotomy. The contents are described as viscid hemorrhagic fluid mixed with pus; the opposite side was not examined at the first operation in this case, but two weeks later, was exposed by operation and removed when its condition resembled that of the other side.

My own case is an interesting example of how easily the cause of the condition may fail of recognition, as would have happened

if the patient had not fallen into my hands for the second operation. This case is unquestionably tuberculous, and makes a third (the others being Ross' and v. Merdervoort's) of undoubted origin, with three other cases very strongly suggestive of tuberculosis (Lewer's, Frankel's, Woolcombe's). In other words, one-fourth of the cases reported as twisted pyosalpinx, are proved to be tuberculous, and one-half are probably so; and furthermore, it is quite likely that at least three of the remainder were not pyosalpinxes when the attack began, but became infected

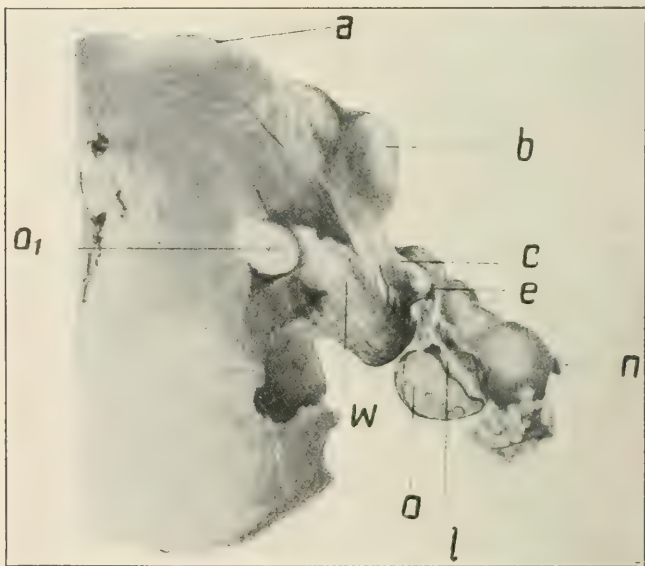


FIG. 13.—Same as Fig. 12. Posterior view.

during the period of observation. The age of one of the undoubted cases is not given; of the other two, it is twenty-four and twenty-six respectively; of the presumably tuberculous cases, the ages are twenty, thirty-seven, and twenty-two; of the other reported pyosalpinxes, the ages are given as thirty-one, thirty-seven, thirty-nine, forty, and fifty-two.

*Miscellaneous Features of the Cases of Twisted Tubal Enlargements.*—There are some interesting features which have been noted in connection with the cases in the literature. The severe pain has often followed a sudden and violent movement or trauma, as sitting down hard after missing the chair (Baldwin),

after suddenly rising from a sitting posture (Clado, Cathelin), after falling on the street (Delbet), after a long walk (Gosset and Reymond), during a ride in a tram-car (Hedley), after straining at stool (Ortner), after cranking an automobile (Ross), after lifting a heavy weight (Stratz).

In some cases (Guicciardi's, Ries', Kauffman's and Lejar's (II)), the torsion either did not produce acute symptoms, or the case was allowed to go without operation for such a time that the twisted part had become more or less completely detached and parasitic. In one case (Chaput's (II)), the hydrosalpinx had ruptured, and the abdomen contained free

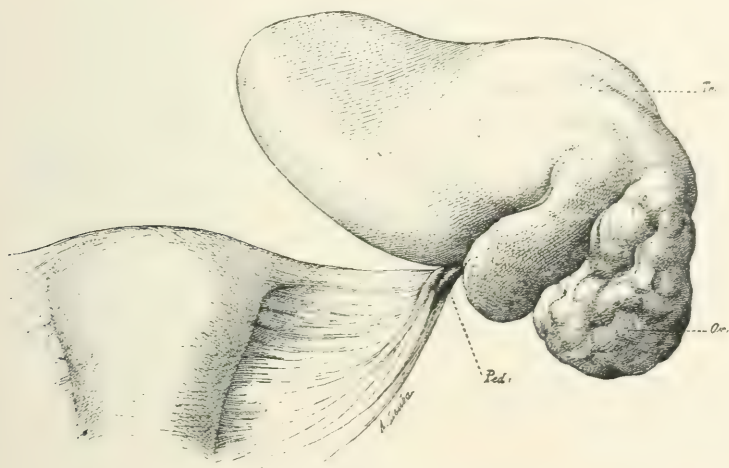


FIG. 14.—Case of Gosset and Reymond.

bloody fluid. In one case (Lejar's IX) (in our list VIII), a large hydrosalpinx of the left side formed an abdominal tumor on the right.

There were certain interesting complications with pregnancy. In one case (Hartman's), the attack occurred in a patient five to six months pregnant; after removal, the patient went on to term and had a normal delivery. On one (Pinard and Paquay's) the operation followed induction of labor and delivery within a few days; the patient had had numerous severe attacks during pregnancy; one of Ward's (II) was four months pregnant; Aulhorn's case was three months pregnant; Martin's (Rouen) patient thought herself pregnant about four months, and the attack at first was regarded as a threatened miscarriage.

The tumor was situated high in Legueu's case (I), so that the abdominal enlargement could scarcely be felt per vaginam; the same was true in Warneck's (II). In Schirmer's case, the appendix was markedly involved; in Pozzi's (I) its participation was suspected. In my own case it contained pus, but most likely this was secondary to the other infection. In one case (Siredy's) there were said to have been no pelvic symptoms, the patient being treated for enteritis, and the tumor, which was abdominal, was discovered by accident.

The abdominal enlargement was sometimes of great size; in Voigt's case, it reached to within three fingers of the umbilicus;



FIG. 15.—Author's case. Right, twisted pyosalpinx. Left, tuberculous pyosalpinx.

in one of Waldo's (II), it reached nearly to the umbilicus, and in Woolcombe's, there were two masses, one extending above the umbilicus on the right, and the other rising out of the pelvis on the left.

#### ABSTRACT, OF CASES IN ONE LITERATURE.

Albertin. Hydrosalpinx tordu avec metrorrhagies abondantes. *Lyon. Méd.*, 1911, cxvii, 29, reports a specimen of hydrosalpinx twisted on a uterine pedicle, having an ecchymotic color, indicative of necrosis.

Alburtn. A propos des hydrosalpinx et de la torsion du pédicule. *Lyon. Méd.*, 1905, cv, 1040.

Case I.—Æt. eighteen. Clinical diagnosis: bilateral ovarian cyst. Anatomic diagnosis: bilateral hydrosalpinx, right, twisted; left ovarian cyst. Side affected, right. Size, fist. Opposite side,



hydrosalpinx; ovarian cyst. Subjective symptom: repeated attacks of abdominal pain.

*Case II.*—Æt. sixteen. Side (?). Twists, 3. Contents, hemorrhagic; ovary, four times normal size and infiltrated with blood. Color, black. Subjective condition: patient had had painful attacks in abdomen. A few days after admission had a very severe attack, from which diagnosis of twist of the pedicle was made. Diagnosis: hydrosalpinx, twisted.

Amann. Stieltorsion einer Hydrosalpinx. *Monat. f. Geb. u. Gyn.*, Bd. xv, H. 2.

Æt. thirty-three. Two children. Sudden acute pain. Previous good health. Median abdominal tumor 3 inches below

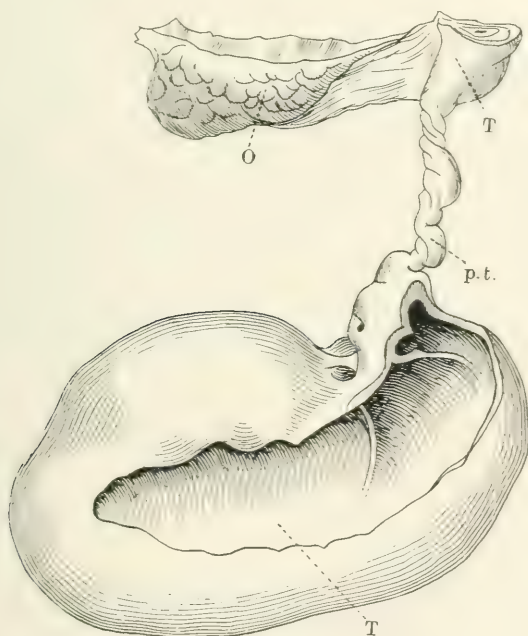


FIG. 16.—Bland-Sultons case.

umbilicus. Operation ten days after attack began. Clinical diagnosis: ovarian cyst; twisted pedicle; right side affected; left side also hydrosalpinx. Anatomic diagnosis: hydrosalpinx, twisted  $2 \frac{1}{2}$  inches to the right; brownish-red color; 20 cm. long and 6 cm. broad. Adhesions to intestine and mesentery. Brownish-red contents.

Arthur. Ueber Axendrehung der Tube. *Deut. Zeit. f. Chir.*, Bd., xlviii, H. 2 and 3, p. 198.

Æt. twenty-one. Clinical diagnosis: appendicitis, or right adnexal disease. Anatomic diagnosis: hydrosalpinx, twisted.

Operation: seven days after acute symptoms began. Seat of tumor, left. Size, ostrich egg. Twist, 1, near uterine cornu. Contents, fluid, black, much injected, sphacelated. Adhesions, none. Objective symptoms: tumor in iliac fossa, easily outlined above. Subjective conditions: pain in lower abdomen, especially left. Vomiting. Menstruation, regular; pain increased during menstruation. Severe pain in left iliac fossa. No fever. Operation: laparotomy (lateral). Remarks: diarrhea.

Aulhorn. Spontane Stieltorsion normaler Adnexe in der Schwangerschaft. *Zent. f. Gynäk.*, Nr. 16, 1910, p. 538.



FIG. 17.—Detail of the right tube and ovary, the pedicle partly untwisted. The parovarium is free. The enlargement is entirely tubal.

Æt. nineteen. Three months pregnant. Pain for some weeks. Acute exacerbation two days before admission. Clinical diagnosis: pregnancy and pyosalpinx. Anatomic diagnosis: right hematosalpinx, twisted, 180; tumor 9 cm. long, dark blue color; ovary involved; uterus, gravid.

Baldwin. Hydrosalpinx with Twisted Pedicle. *AMER. JOUR. OBST.*, liv, 1906, p. 654.

Æt. forty-three. No children; one miscarriage. Missed chair and sat down heavily; three hours later, severe pain. Clinical diagnosis: acute appendicitis. Emergency operation. Right side affected. Left tube also hydrosalpinx. Ovaries not disturbed and not affected. Tubes contained serum and blood. Diagnosis: hydrosalpinx, twisted, and gangrenous.

Baudron. Torsion du pédicule d'un hydrosalpinx droit coïncidant avec la rupture d'une grossesse tubaire gauche. Laparotomie, guérison. *Compt. Rend. Soc., d'obst. de Gyn. et de Pæd.*, ii, 1900, 90.

Æt. thirty-two. One miscarriage at nineteen years. Clinical diagnosis: tubal pregnancy (ruptured). Anatomic diagnosis: hydrosalpinx, twisted. Side, right. Size, orange. Location, tumor adherent to parietal peritoneum of pelvis. Form, irregular, nodular, ecchymotic. Size of pedicle, little finger. Twists, 2. Contents, 300 gm.; black blood. Adhesions recent. Ovary not twisted. Adnexa of opposite side, tubal pregnancy. Objective signs: abdominal tumor; culdesac entirely free. Subjective conditions: menstruated at twelve years; regular; leukorrhea; severe abdominal pains; tendency to syncope. Operation: laparotomy (bilateral); castration. Result: cure. Remarks: symptoms of tubal pregnancy had masked the torsion.

Bell. Torsion of the Pedicle in Hydrosalpinx and Other Morbid Conditions of the Fallopian Tube. *Jour. Obst. and Gyn., of the British Empire*, 1904, No. 5, p. 514.

Æt. forty-five. Married at nineteen; child in eighteen months; no other pregnancies. Family history tuberculous. Patient had recurrent attacks of bronchitis. Attack of severe pain in 1899, with faintness and vomiting; lasted two hours; no doctor. In 1901, another. Present attack sharpest. Abdominal tumor found. Clinical diagnosis: twisted pedicle. Left side affected; right also hydrosalpinx. Diagnosis: hydrosalpinx twisted  $1\frac{3}{4}$ ; reversely to watch. Twisted tube almost black in color.

Bland-Sutton. Salpingitis and Some of Its Effects. *Surg. Dis. of the Ovary and Fallopian Tubes*, London, 1891, p. 257.

Case of H. Morris. Not acute; ovary uninvolved. Diagnosis: hydrosalpinx twisted three and one-half times. Contents, bloody. Dense adhesions. Separation and parasitic growth of enlargement.

Boursier. De la torsion du pédicule des salpingites Hystiques. *Jour. de méd. d. Bordeaux*. Nr. 30, 1901, p. 512.

Æt. thirty-four. o-Para. Clinical diagnosis: endometritis; adherent retroflexion; salpingo-oöphoritis (right). Anatomic diagnosis: hydrosalpinx, twisted. Subjective condition: menstruation at twelve years; regular. In 1899, severe pains right iliac fossa, especially if fatigued, increased at menstrual periods; gradually grew worse, coming on in attacks when fatigued. During month before admission (1901), pains suddenly increased in violence without apparent cause; went to bed; slight fever frequently, and painful micturition. Objective signs: abdomen not distended. Behind and right of uterus a not very hard mass, difficult to outline; tender. Side affected, right. Opposite side, follicular cysts in ovary; congested tube. Number of twists,  $2\frac{1}{2}$ . Twisted tube, adherent to posterior surface of uterus and neighboring organs, forms a rounded mass containing So

gm., reddish-brown, hemorrhagic, syrupy fluid. Operation: right salpingo-oophorectomy. Result: cure.

Burrage; Case of Acute Torsion of Fallopian Tube with Hematosalpinx. *Bost. Med. and Surg. Jour.*, cliv, 1906, No. 11, p. 295.

Æt. twenty-six. Married two years; no pregnancies. Treated for dysmenorrhea, December, 1898. Dudley operation. Pelvis negative, except prolapse of right ovary. Acute attack November, 1899. Clinical diagnosis: pelvic abscess. Anatomic diagnosis: hydrosalpinx twisted. Right salpingectomy; resection of both ovaries. Right side affected. Left tube normal. No free blood. Both ovaries riddled with cysts. Twisted hydrosalpinx adherent to bladder and surrounding structures. Color, dark reddish-brown. Contents, blood-clot, no villi.

Cathelin. De la torsion des Hydrosalpinx. *Revue de Chirurg.*, xxiii, 1901, p. 263.

Æt. twenty-six. One miscarriage of five months, seven years previously. Clinical diagnosis: large salpingitis (left); slight annexitis (right). Anatomic diagnosis: hydrosalpinx, twisted. Seat of tumor, left. Size, hen's egg (6-7 cm. long diameter). Tubal localization, external portion. Form, ovoid. Color, blackish. Twists, 2 1/2 direct. Contents, 200 gm. blood; no clots; adhesions present. Ovary not twisted. Adnexa of opposite side normal. Objective signs: tender mass in posterior culdesac (left). Subjective conditions: menstruated at eleven and one-half years; regular; very active pains in left lower abdomen three years before operation, without other symptoms; for three years uterus discomfort. Evening before operation, violent pains on rising from a chair. Operation: laparotomy; unilateral castration. Result: cure.

Cathelin. Case II. Salpingite gauche à pédicule tordu, hydrosalpinx droit prolabe. *Bull. et. mem. de la Soc. Anat. de Paris*, 1900, 6 S., T. ii, lxxv, 673.

Æt. forty. II-para. Sudden seizure; repetition in sixteen days; mobile tumor on right, by pelvis examination. Hydrosalpinx, left, twisted one and one-half times, direction hands of watch. Ovary not involved. Blackish tumor. Right hydrosalpinx adherent in Douglas' pouch.

Chaput. Contribution à l'étude de la torsion des hematosalpinx compliquant les atrésies vaginales congénitales. *Revue de Gyn.*, Tome x, 1906, p. 963.

Case I. Æt. twenty. Subjective condition: never menstruated; at age of seventeen, vague pains in abdomen; recurred following month, then every month, accompanied with increase in size of abdomen. Lasted at first, eight days, but on admission, this had increased so that patient suffered two weeks every month. Objective signs: abdomen swollen; resembles abdomen of large



fibroid. On percussion, dulness; on palpation, uterus very large, hard, tender, reached to about umbilicus. Iliac fossæ filled with masses which seem attached to sides of uterus. Hymen imperforate; not bulging. On rectal examination, whole small pelvis full of tumor mass. Operation: puncture of hymen, followed by discharge (1½ liter) blackish blood. Paravaginal incision, left, above the point of stricture, vagina much dilated; cervix dilated; uterus empty. Postoperation: large tumor felt in right iliac fossa (hematosalpinx); blood in abdominal cavity. Right tube size of fist; black; perforated at one point. Pedicle twisted six times. Left tube (smaller) twisted five times. Both removed. Result: death next day (in coma).

*Case II.*—Æt. eighteen. Subjective condition: normal to sixteen years of age, then mental disturbance; no menstruation; severe pains in iliac regions each month; nausea; syncope. For two months previous to admission, pains worse and more frequent. Objective findings: tumor in right flank rising to level of umbilicus, per rectum. This mass seems to occupy posterior culdesac. Vaginal examination impossible. Hymen imperforate. Operation: dissected between urethra and rectum. At depth of 6 cm., hematocolpos found; brown fluid, 1 1/2 liter evacuated. Result: death second day. Autopsy: Both uterine cornua distended, especially right. Right tube long, apoplectic; extremity dilated by hematosalpinx, had been punctured in the colpotomy; twisted once, including mesovarium. Opposite adnexa, tube long, ovary normal; uterus bicornute. Remarks: outer end of tube had no mesosalpinx and end was adherent to abdominal wall. Tube seemed to have twisted between the two fixed parts, formed by this adhesion and by the tuboovarian ligament.

Clado. Salpingite à pédicule tordu; guérison. *Bull. et mem. de la Soc. de Anat. de Paris*, 1900, 6 S., ii, 41.

Æt. thirty. o-para. No miscarriages. Clinical diagnosis: bilateral salpingitis; acute exacerbation, right. Anatomic diagnosis: hydrosalpinx, twisted. Seat of tumor, right; size of child's head. Tubal location, external portion. Formed mass with convexity above; base at mid-point of line, from pubes to umbilicus. Size of pedicle, little finger. Twists, 3, reverse. Contents, 300 gm.; black blood, no clots. Adhesions, posterior. Opposite adnexa, cystic, sanguineous fluid. Objective signs: abdomen swollen, right; mass in true pelvis, and rising to umbilicus; hard; on left tumor size of mandarin, fluctuating, not adherent, encroaching on left posterior culdesac. Subjective conditions: menstruation at twelve years; irregular. Pains in lower abdomen. Abundant metrorrhagias. Sudden and severe pain on right, when rising from sitting posture. Vomiting; fever. Operation: laparotomy castration. Result: cure. Remarks: four to five little hemorrhagic cysts in thickness of the cyst wall.

Delbet. Torsion du pédicule dans un cas de salpingite. *Bull. et mem. de la Soc. de Anat. de Paris.*, 1892, p. 300.

Æt. thirty-nine. Clinical diagnosis: intestinal strangulation from bands or volvulus of sigmoid. Operation within thirty-six hours. Anatomic diagnosis: hydrosalpinx, three twists; left side affected. Size, intestinal loop. Tubal location, external portion. Contents, blood. Right hydrosalpinx. Ovary not twisted. Objective signs: abdomen retracted; palpation very painful; vaginal examination impossible. Subjective conditions: very sudden and severe pain; fainting. Patient fell while walking on street. Continued vomiting, not fecal, no gas or food. Pulse full, rapid; temperature, normal. Operation: laparotomy, (bilateral); castration. Result: cure.

Delore und Alamartine. Volumineux hydrosalpinx en apparence primitif. *Lyon Méd.*, 1909, Nr. 9, p. 416.

Æt. thirty-eight (virgin). No genital history. Right side affected; contains  $1/2$  liter clear yellow; wall thin and transparent. Left side also hydrosalpinx. Ends of both tubes obliterated. No menstrual symptoms. No signs of infection. Diagnosis: hydrosalpinx, right, twisted two to three times. Voluminous hydrosalpinx, right, containing  $1/2$  liter fluid, attached by a delicate pedicle which showed traces of torsion in the form of two or three spiral turns, slightly lobulated, and shape of bagpipe; right ovary, left; left tube slightly cystic. In this patient, no preceding genital infection could be demonstrated; ovaries and uterus appeared healthy. Author considers attenuated tuberculous infection as cause of hydrosalpinx. "In view of the frequency of genital tuberculosis, apparently increasing from day to day, it seems not illogical to ask if hydrosalpinx is not sometimes symptomatic of an attenuated tuberculous infection, as is the case, for example, with hydrocele." Some of the liquid was injected into a guinea-pig. No report of result.

Fraenkel, L. Beiträge zur Pathologie und Therapie der Salpingitis. *Monats. f. Geb. u. Gyn.*, Bd. 35, H. 4, p. 459.

Æt. twenty. No children, not married. Suppurating cervical glands in childhood, and pneumonia twice. Menstruated regularly from twelve years of age. Appendicectomy five years ago. Fourteen days previous, severe pain and vomiting; attack repeated twice; since then, continuing severe pain. Clinical diagnosis: bilateral ovarian cyst with twisted pedicle. Operation after fourteen days' observation. Right side affected. Anatomic diagnosis: pyosalpinx— $3 \times 180 = 540$  twisted. No adhesions. Yellow color. Resembled dermoid. Wall thin. Tumor light in weight; size of fist. Abdominal ostium free. Fimbria neither swollen or reddened. Pus thick, caseous, tolerably dry, and no odor. Left side same as right, but not twisted, 20 cm. long, outer, 2 cm., and fimbria entirely normal, size of child's fist. Pus from this tube gave neither tubercle

gonococci, pneumococci, or bacteria coli, but only slender non-acid fast rods in sparse number, and weak stain. The culture showed also a few staphylococci.

Francais. Salpingite avec torsion. *Societe Anatomique*, Oct. 30, *la Presse médicale*, Nr. 89.

Cystic salpingitis with torsion of pedicle. Abundant hemorrhage in tubal wall; hemorrhagic fluid in cyst cavity. Other tube normal. (No other data given).

Fritsch, H. Die Krankheiten der Frau. Braunschweig, 1894, p. 469.

Simply declares that every hematosalpinx is not a tubal pregnancy, and reports a very movable hematosalpinx with a twisted pedicle, but gives no details. Diagnosis: hydrosalpinx, twisted; size of fist.

Funke. Stieltorsion bei Hydrosalpinx. *Hegars Beiträge*, Bd. vii, H. 3., 1904, p. 450.

Æt. twenty-eight, virgin. Typhoid fever at twenty. Abdominal tumor for one-half year, increasing in size. Clinical diagnosis: inflamed tumor of left adnexa. Anatomic diagnosis: hydrosalpinx, twisted. Left side affected, well hidden by adhesions. Right also hydrosalpinx, not adherent, also twisted. Ovary, normal; left twist 1 1/2 opposite to watch; right twist 1/2 with watch; yellow clear fluid.

Gosset and Reymond. Salpingo-ovarite a pédicule tordu. Laparotomie, guérison. *Ann. de gyn.*, 1899, p. 21.

Æt. thirty-one. III-para. Seat of tumor, left, size of fist. Tubal localization, external portion. Form, smooth. Pedicle twisted at 2 cm. from uterus. Twists, 1, direction contrary to watch. Contents, chocolate-colored fluid. Adhesions, none. Ovary, twisted. Opposite adnexa, healthy. Objective signs: suprapubic mass rising to five fingers above pubis; slight lateral mobility; posterior culdesac filled by resistant mass corresponding with the suprapubic tumor. Subjective conditions: menstruation, normal. Pain since first pregnancy, especially at periods. After a long walk, suddenly seized with severe pains in abdomen, maximum in left flank, radiating to lumbar region. Vomiting of food and bile. Operation: laparotomy. Result: cure.

Goullioud. Taken from Cathelin (*Revue de Chirurg.*, No. 2 and 3, 1901, p. 263).

Æt. thirty-seven. o-para. Clinical diagnosis: pelvic fibroma, complicated by ovarian cyst. Anatomic diagnosis: fibroma and hydrosalpinx, twisted. Seat of tumor, right. Size of child's head. Tubal localization, external portion. Form, irregular; color, bloody. Twists, 2. Contents, fluid, hemorrhagic, not viscid. Adhesions easily separated. Ovary twisted. Opposite adnexa, cystic. Objective signs: abdomen distended. Fibroma reaching to umbilicus. In front of this hard tumor,

another, more fluctuating, not reaching to symphysis. In right iliac fossa, another smaller tumor, size of an egg, very hard and tender. Per vaginam, nothing felt but fibroma. Subjective conditions: six years previous, menstruation became more painful, more abundant, and lasted longer. Sixteen months previous, intestinal colics, syncopal attacks, vomiting. Attack again in three months, then several more. For several months, normal, then eight days before admission to hospital, acute pain with sudden enlargement of abdomen. Morphine. Pain radiating to right leg. Operation: laparotomy, *bilateral castration*. Result: cure. Remarks: after operation retrogression of fibroma and improvement in pulmonary and pleural tuberculous lesions, (right).

Guicciardi, G. (Florence). Ueber spontane Tubenresektion. *Gynecologia*, 1905, Nr. 4.

Æt. forty-nine. Single. Right side affected. Left adnexa and right ovary adherent. Sactosalpinx confined to ampulla of tube. Cheesy contents. Diagnosis: sactosalpinx (right). Completely separated from uterine stump of tube; 3 cm. distance between two ends. This author met with five cases of tubal torsion in 1041 laparotomies, with three actual amputations of the enlarged tube.

Harpöth. Beitrag zur Kasuistic der Sactosalpinx mit Torsion des Stieles. *Zent. f. Gyn.*, Nr. 52, 1900, p. 1399.

Æt. twenty-six. (Seamstress). No pregnancies, but no hymen; vaginal orifice wide; no stated evidences of infection. Clinical diagnosis: ovarian cyst and torsion; heart and lungs, normal, general health very good. Operation after six weeks' observation. Anatomic diagnosis: hydrosalpinx, twisted. Left side affected. Right tube not twisted, but also sactosalpinx. Although not definitely stated, presumably no tubal, but a few omental adhesions. No bacteria found on microscopic examination and no cultures. Contents of tube, seropurulent (sterile); twisted two and one-half times, from left to right.

Hartman, H. and Reymond. La torsion du pédicule des salpingo-ovarites. *Annal. de gynéc.*, Sept. 1894.

Æt. thirty. Subjective conditions: pains in right side of abdomen. Last three years patient noticed tumor. Occasional severe attacks accompanied with vomiting. Right side affected. Hydrosalpinx and cystic ovary. Adhesions to surrounding organs. Contents, one and one-half liters sanguinolent fluid. Diagnosis: hydrosalpinx, two twists in direction of hands of watch.

Hartman, H. and Reymond, E. Contribution à l'étude de l'anat. path. et de la bacteriologie des salpingo-ovarites. *Annal. de gynéc.*, 1898.

o-para. Clinical diagnosis: bilateral salpingitis. Anatomic diagnosis: hydrosalpinx, twisted several times, opposite to



hands of watch. Seat of tumor, left. Abdominal enlargement. Form, lobulated; color, dark red; size of pedicle, finger. Contents, 400 gm. blood. Right side also hydrosalpinx. Adhesions, with all adjacent organs (uterus twisted one-half time). Ovary twisted posteriorly and below. Objective signs: increase in size of tumor; tension; dullness; signs of peritonitis. Subjective conditions: menstruation normal. Violent pains on right side of abdomen, radiating down thigh. Vomiting. Fever. Operation: Laparotomy, *bilateral castration*. Result: cure.

Hartman. La torsion des salpingites. *Comptes rendus de la soc. d'obst. de gyn. et de pæd. de Paris*. 1900, ii, 28.

Case I. Æt. forty-four. Pains in right side of abdomen, coming on in attacks for two years. Examination, subumbilical tumor; fluctuating. Right side. Pedicle size umbilical cord. Twisted twice, reversely. Color, brown. Contents, 500 gm. blood. No mention of just what composed tumor, tube (?), ovary (?), both (?). No mention of opposite adnexa. Result: cure.

Case II.—Æt. twenty. When five to six months pregnant, suddenly seized with pain in right iliac region; vomiting; distention; fever. Next day operation. Right adnexa enlarged, adherent, hemorrhagic. Pedicle twisted once, reversely. Removal. Cure. Normal delivery at term.

Case III.—Æt. thirty-three. Cured several times for metrorrhagia. December 7, 1899, sudden violent abdominal pains; in following days, signs of pelvic peritonitis gradually subsiding. Tenderness remained. Large mass in abdomen, reaching to umbilicus. Operation January 3, 1900. Large blackish tumor formed by right salpingitis, with pedicle twisted directly. Ovary not involved. Uterus twisted one-half time. Contents, sterile, fluid.

Hartman, C. R. Un nouveau cas d'annexite à pédicule tordu. *Comptes rendus de la soc. d'obst. de gyn. et de pæd. de Paris*, 1900, ii, 254.

Æt. twenty-five. I-para (eight months previous). Clinical diagnosis: appendicitis or tubal disorder. Anatomic diagnosis: hydrosalpinx, twisted (right). Tubal localization, two tumors, one internal superior, other external and inferior. Color, brownish-black. Twisted one-half, reversely. Contents, blood; clots. Adhesions, numerous. Ovary, twisted. Opposite adnexa, adhesions, liberated. Objective signs: abdomen, flaccid; tumor in hypogastrium, reaching to right iliac fossa; irregular; painful. Per vaginam, mass posterior to uterus, continuous with abdominal tumor. Subjective conditions: three years previous, severe pains on rising, pains radiating to right leg. Attack during pregnancy. Six weeks previous to operation, sudden abdominal pain without vomiting; fever. Operation: laparotomy, *unilateral castration*. Result: cure. Remarks: appendix adherent; removed.

Hedley. Hydrosalpinx with Torsion of the Pedicle. *Proc. Roy. Soc. Med.*, London, 1907-1908, p. 95.

Æt. twenty-three. Single. Rickets. One brother tuberculous. Under treatment for lateral curvature. Acute symptoms came on in a tram-car. Operation after seventeen days of acute pain in lower abdomen. Removal of affected tube. Left side affected. Diagnosis: hydrosalpinx twisted twice, in direction of hands of watch; size of small orange. Contents, sterile, thin, blood-streaked fluid. Ovary and appendix, normal. No adhesions mentioned; presumably not many, as tumor was not twisted.

V. Herff. Hematosalpinx mit Torsion. *Verhandlung d. Gesell. f. Gyn.*, Kong., 1895, p. 695.

Exhibited a specimen as above. (No details.)

Hirst. Torsion of the Fallopian Tube. *AMER. JOUR. OF OBST.*, vol. xxxiii, p. 263.

Left side affected. Other pelvic organs normal. No other details. Diagnosis: hydrosalpinx twisted three times, in association with fibroid uterus.

Jacobs. Fibromyoma. Pyosalpinx. Vollständige Drehung der linken Tube um ihre Achse. *Zent. f. Gyn.*, Nr. 50, 1896, p. 1283.

Vaginal operation, four to six weeks' observation. Morcellement of fibroid. Left side affected. Pyosalpinx of right side; right ovarian abscess; interstitial fibroid of uterus. Diagnosis: pyosalpinx twisted (?), at a distance of 3 cm. from uterus. No gangrene, but great thinning of tube.

Kauffman. Einen Fall von Selbstamputation der Tube. *Zent. f. Gynäk.*, Nr. 11, 1903, p. 344.

Æt. (?). Three children; one miscarriage. Clinical diagnosis: retroflexion with adhesion; much pain; unable to work. Diffuse adhesions of both adnexa. Right side affected; consist of two parts, a short uterine stump, and an outer 3 cm. long, part with fimbriated extremity closed; size of cherry. Anatomic diagnosis: hydrosalpinx detached by torsion and parasitic.

Klein. Isolierte Stieltorsion einer Sactosalpinx. *Monats. f. Geb. u. Gyn.*, 1912, p. 655.

Æt. thirty-five. II-para. Clinical diagnosis: ovarian cyst; twisted pedicle. Three attacks previously. Anatomic diagnosis: hydrosalpinx, twisted 360°; ovary adherent; bluish-black tumor.

Kadygroboff.—Zur Frage über die primäre Torsion der Tubæ Fallopiaë. *Jour. akusch. i Shensk. boles.*, Jan. and Feb., 1906. Ref. *Zent. f. Gyn.*, Nr. 32, 1907, p. 991.

Æt. twenty-six. Nullipara. Right hydrosalpinx; slow twisting, almost complete separation from inner part of tube. String-like connection, 1 cm. long. Contents, bloody. Tumor, oblong, disseminated red spots.

Legueu. La torsion des salpingites. *Presse medicale*, 1900, p. 37.

*Case I.*—Æt. thirty-three. III-para. Clinical diagnosis: cyst of ovary with twisted pedicle or pyosalpinx. Anatomic diagnosis: hydrosalpinx, twisted. Seat of tumor, right. Twists one-half from right to left, and from behind forward (region of ampulla turned toward uterus). Contents, 400 gm. blood; ovary not twisted. Opposite adnexa, healthy. Objective signs: above to right umbilical tumor with rounded upper margin, whose lower end reaches into small pelvis. To palpation, resistant, tender; hardly to be felt per vaginum. Subjective conditions: sudden pains at menstrual periods, especially right; vomiting of food and bile. Operation: Laparotomy; *unilateral castration*. Result: cure.

*Case II.*—Æt. twenty-six. Anatomic diagnosis: hydrosalpinx. Seat of tumor, right; size of hen's egg. Form, smooth, regular. Twists, 1 1/2. Adhesions, none, neither pelvic inflammation. Ovary not twisted. Objective signs: mobile tumor, slightly tender, in posterior culdesac, independent of uterus. Subjective conditions: acute pains in abdomen at menstrual periods for past two years, especially right. Leucorrhea only during intervals. Operation: laparotomy; *unilateral castration*. Result: cure.

Lejars. Des torsions tubaires. *La Gyn.*, Jan., 1910, p. 70, and *Compt. rend. de la soc. d'obst., et de gyn. et de pæd. de Paris*, 1909, xi, 342.

*Case I.*—Æt. twenty-two. o-para. Clinical diagnosis: tubal pregnancy in course of aborting. Subjective conditions: last period November, 1907. In January, 1908, sudden severe pains right side; vomiting; fever. Objective examination: cervix soft: corpus above symphysis. Tender mass bulging in posterior culdesac. Operation, January 28, 1908 (ten days after onset of symptoms). Large adnexal mass on right; blackish; pedicle twisted (?) twice. Right side removed. Result: cure. Remarks: Uterus size of two months' pregnancy. Opposite adnexa: Healthy. (Pregnancy continued to term; normal delivery; no microscopic examination given.) Microscopic diagnosis (?).

*Case II.*—Æt. thirty-two. Clinical diagnosis: fibroma (retro-peritoneal). Subjective conditions: three years previous, suddenly taken with pains in abdomen, which lasted several days. Reappeared at menstrual periods and when fatigued. Three months before operation, severe attacks; bed for ten days. Objective findings: mass size of fist, anterior and left of uterus. Operation: large, blackish tumor anterior and left of uterus, everywhere adherent corresponding to left adnexa, attached to left cornua by pedicle twisted twice, undergoing ulceration. (No microscopic examination.)

*Case III.*—Æt. thirty-one. III-para. No pain till two weeks before operation; sudden onset. Objective findings: cervix large,

hard; in right culdesac; mass size of two fists, hard, fixed. Clinical diagnosis: Intraligamentous fibroid. Operation: Mass consists of large tube twisted (? times); loop of intestine adherent. Contents, pus.

*Case IV.*—Æt. thirty-eight. o-para; miscarriage none. Severe pains; sudden onset six weeks before admission. Examination: Nodular, hard tumor, fixed, reaching to three fingers below umbilicus, filling left iliac fossa. Operation: fibroid with many intestinal adhesions; left tube large, blackish, *external half* twisted, the torsion being maintained by fine, recent adhesions. Opposite adnexa, normal. Hysterectomy. Cure.

*Case V.*—Æt. fifty. III-para. Miscarriage one. Still menstruating. For two months metrorrhagia, profuse; leucorrhea. No severe pains; general feeling of weight in abdomen. Examination: large adherent mass in pouch of Douglas, which appeared to be in large part, constituted by retroflexed uterus. Operation: uterus retroverted; on left, a prolapsed blackish tube, filled with hemorrhagic fluid, twisted several times on its pedicle. Cure.

*Case VI.*—Æt. forty-three. Operated upon for uterine fibroid. As a chance finding, double hydrosalpinx size of lemons, each twisted on its pedicle.

*Case VII.*—Æt. forty. History and symptoms, chronic salpingoophoritis. Operation: right ovary healthy; "the tube in its inner three-quarter, healthy; the ampulla was transformed into a little blackish pouch, attached to a twisted pedicle, and in part detached." Contents (of the little pouch) black, hemorrhagic liquid mixed with a little pus. Diagnosis: salpingitis, torsion, necrosis. The torsion had been eccentric, and had involved only the ampulla. Opposite adnexa, cystic ovary, tube large, closed.

Lejars. Un nouveau cas de torsion de la trompe. *La Gyn.*, 1910, p. 76, and *Compt. rend. de la soc. d'obst. de gyn. et de pæd. de Paris*, 1909, xi, p. 357.

*Case VIII.*—Æt. twenty. Pains right abdomen came on one month before operation. Painful micturition. Examination: Round tumor in suprapubic region (right), size of an orange; consistency of dermoid, which was the clinical diagnosis. Operation: large hydrosalpinx of left side, transposed to right, twisted three times on itself; torsion maintained by adhesions. Ovary healthy, situated above point of torsion. Opposite adnexa, normal, uterus small. Result: cure.

Lewers. Pyosalpinx with Twisted Pedicle. *Trans. Obst. Soc. of London*, vol. xlv, 362.

Æt. thirty-seven. Single. First attack of pain and vomiting, December, 1901; second, May, 1902; third, September, 1902. Clinical diagnosis: Double ovarian tumor with twist of pedicle. Operation: October, 1902. Both tubes removed: neither ovary. Right side affected. Left pyosalpinx not twisted. Right pyo-



salpinx adherent to small intestine, omentum, and bladder. No tuberculosis demonstrated, but thought likely. Sepsis and gonorrhea fairly well excluded. Diagnosis: pyosalpinx twisted several times. Right ovary not involved.

McCann. A Case of Hematosalpinx, due to Tubal Pregnancy Complicated by Torsion of the Pedicle. *Lancet*, May. 9, 1903.

Æt. thirty-four. Curetment in 1898 for purulent discharge; no abnormality of adnexa recognized at that time. Sudden seizure October, 1900; recurred March, 1901; recurred April, 1901; third attack May, 1901. Operation: June 15. Right side affected. Diagnosis: ectopic pregnancy; three twists. Bluish-black color, ascitic fluid. Right ovary, and opposite adnexa, normal.

McIlroy. Hydrosalpinx with Torsion of the Tube. *Scottish Med. and Surg. Jour.*, Aug., 1904, p. 150.

Æt. forty-three. Married. V-para. Last labor eleven months ago. Attack pain during last pregnancy, and felt as if there was some obstruction to last delivery. Thereafter, pressure symptoms. Left side affected. Anatomic diagnosis: hydrosalpinx; outer third of tube enormously distended; three twists of tube at different parts; outer third necrotic. This I believe was parovarian cyst, but author has looked into it pretty carefully and thinks it otherwise. Complete torsion of tube at three distinct points; necrosis of outer cystic part, containing chocolate-colored fluid and flakes of fibrin. Parovarium distinct. Author thinks tumor is definite part of outer tube. Drawing looks as if it were a parovarian cyst; still author regards it as a hydrosalpinx.

Maillard. De la torsion des salpingites. *Thes de Paris*, 1897 and 1898, quoted by Lagueu, *Presse méd.*, 1900, p. 37 (second case).

Æt. forty-nine. IIIpara, last seventeen years previous. Clinical diagnosis: pyosalpinx, right, with less severe adnexal disease, left. Anatomic diagnosis: hematosalpinx; twisted pedicle. Seat of tumor, right. Twists, one and one-half in direction of hands of watch. Form, globular. Ovary, normal. Contents, coagulated blood. Opposite adnexa, ovary cystic. Objective signs: uterus three fingers above symphysis. Tumor felt high in right culdesac; size as large as an egg, resistant. Attached to uterus on one side, to pelvic wall on other. In left culdesac a smaller, long tumor, attached to uterus, slightly tender. Subjective conditions: menstruated at age of thirteen. Four years before operation, leucorrhea, pain on urination, tenesmus, diagnosis of gonorrhea. Shortly afterward, began to have abdominal pains, which for last year considerably increased. These came on in attacks, always beginning on right side, radiating to lumbar region, and down thigh to knee; vomiting; distention of abdomen; attacks lasted three days, gradually

passing into period of calm, generally lasting about one and one-half months. In year preceding operation, had had seven attacks. Result: cure. Operation: supravaginal hysterectomy with both adnexa. Remarks: fibroid uterus.

Malcolm. A Twisted Inflamed Fallopian Tube. Proceed.

Roy. Soc. Med., London, 1907-1908, p. 99.

Married fifty-two years; eight children. Acute attack after two years of pelvic symptoms, and operation one month after acute attack. Severe pain on two or three occasions. Clinical diagnosis: pyosalpinx. Left side affected. Right side, normal. Left ovary uninvolved. Adhesions about twisted mass in Douglas' pouch. Anatomic diagnosis: pyosalpinx (?) twisted. Says nothing about contents. Deep bluish-black color.

Martin, A. Eine Tubarschwangerschaft mit Stieltorsion. *Zeits. f. Geburtsh. u. Gyn.*, 1893, Bd. 26, 221.

Æt. thirty-one. Five children. Pain for two weeks, making patient unfit for work. Mass size of two fists, in left side of pelvis. Left side affected; ovary attached. Right side normal. Diagnosis: ectopic pregnancy (tubal); twisted twice. Adhesions all around. Microscopic examination confirms diagnosis. Bloody ascites.

Martin, (Rouen). Torsion du pédiculed' an hydrosalpinx droit. *Ref. Comp. rend. de la soc. d'obst. de gyn. and de pæd. de Paris*, 1906, viii, 147.

Æt. thirty-four. Nullipara. Thought herself four months' pregnant, and threatened with miscarriage. Nine years previous, in bed one month on account of severe pains in lower right quadrant of abdomen. Since then, not seriously ill. Past four or five months, distention of abdomen, accompanied with diminution in menses. Nausea and vomiting in morning. Just before admission, suddenly seized with violent abdominal pains; vomiting. Examination: uterus normal in size. In right culdesac a rounded, fluctuating tumor, tender, distinct from uterus. Clinical diagnosis: torsion of pedicle of small ovarian cyst, or *more probably* of a right salpingitis. Operation: smooth, fluctuating tumor in Douglas; no adhesions; it was the *right tube*, internal end forming pedicle, two reverse twists. A hydrosalpinx; ovary not involved. Opposite adnexa, normal. Tumor measured 110×90 mm.

v. Merdervoort, Pompe Van. Een geval van torsie van een pyosalpinx. *Nederl. Tijdsch voor verlosken Gyn.*, p. 175. *Abst. Frommel's Jahresbericht*, 1905, p. 209.

Æt. twenty-four. Lower abdominal pain for five years. Left side affected. Right side also large pyosalpinx. Diagnosis: pyosalpinx. Both pyosalpinges were tuberculous. Outer part size of egg. Interstitial part converted in fibrous strand from torsion.

Michel. Eine Beobachtung doppelseitiger Torsion beider Tuben. *Ann. de Gyn. et d'obstet.*, 1907. Ref. *Zent. f. g.*, 1909, 24, 863.

Æt. thirty-five. Married. II-para. Operation: four weeks after first attack. Both sides affected. No pus in tubes, although woman had had fever. Diagnosis: hydrosalpinx, right; twisted four times, left to right. Hematosalpinx, left: twisted three times, right to left.

Morel. Hématosalpinx à pédicule tordu. *Bull. et mémoir de la soc anat. de Paris*, Dec., 1903, p. 863.

Æt. IV-para. Clinical diagnosis: ectopic pregnancy. Subjective conditions: had missed no period. Severe pain one morning in left side, spreading to whole abdomen. Vomiting; bile. Examination of abdomen: rigid, tender. Mobile tender, tumor in posterior culdesac. Operation (next day): uterus large, appears gravid. Right adnexa normal. Posterior culdesac occupied by a mobile, violet-colored tumor, developed from left adnexa; size of turkey egg. Pedicle twisted five or six times reversely. Wall of tubal sac delicate, and through it can be seen the hemorrhagic contents. (No anatomical diagnosis; ectopic (?); hematosalpinx?)

Nanu. Hematosalpinx torsion du pédicule. *Bull. et mem. de la soc. de chir. de Bucarest*, 1900, 160.

Trans. "M. Nanu presented a specimen, obtained by abdominal hysterectomy, of a uterine fibroid with both tubes. One of these, a *right hematosalpinx*, has the pedicle twisted twice about its axis; it occupies the position of the cecum, which it resembles in form. It had also adhesions to the omentum."

Ortner. Berichte aus der Geburtsh. u. Gyn. Gesellsch. in Wien. *Zent f. Gyn.*, 1909, 29, 1025.

Æt. thirty. Evidences of previous infection not discussed. Symptoms acute, followed straining at stool. Chills, vomiting, and pain. Operation after six days' symptoms; mass found a month before. Left side affected. Tube thick as ball of thumb, swollen and dark blue; mucosa gone, inside tube. Right side, abdominal ostium closed. Omentum adherent to fundus. Diagnosis: hemato- and pyosalpinx twisted about 2 cm. from uterus, one and one-quarter times in direction of hands of watch. Left ovary, normal. Hemorrhagic infarcts in tube wall; pus and blood in contents.

Pierson. Reported by Storer. A study of Axis Rotation with Especial Reference to the Torsion of Ovarian Tumors. *Bost. Med. and Surg. Jour.*, cxxxv, No. 19, 1896, p. 461. Acute appendicitis. Right side affected. Tube full of pus; lay above pelvic brim with fimbriated extremity looking toward the loin. Diagnosis: pyosalpinx twisted one and one-half from before backward, close to uterine end.

Pinard and Paquy. Torsion de pédicule d'un hydrosalpinx droit coïncidant avec une grossesse de quatre mois. *Compt. rend. de la soc. d'obst. gyn. pæd.*, Paris, 1901, October.

Æt. twenty-six. One child previously. Numerous severe attacks of pain during the second pregnancy, and for past five years; vomiting in last attack; pain, nausea, frequent micturition, vomiting, diarrhea, meteorism, and icterus. Operation after induction of labor and emptying of uterus, because symptoms continued, especially fever. Right side affected. Right salpingo-oophorectomy. Pregnant uterus. Diagnosis: hydrosalpinx twisted twice, reversely to hands of watch; size of orange. Ovary, normal. Another reference to the same case, and from which some of the notes were taken is: *Compt. rend. de la soc. d'obst. gyn. et de pæd. de Paris*. 1902. The age here is given as thirty-six, but all other details are the same.

Poirier et Cathelin. Salpingite. gauche tordue. *Bull. Soc. Anat. de Paris*, 1900, 209.

Æt. forty-two. III-para, last twelve years previous. Clinical diagnosis: retroflexed uterus, or probably adnexal disease. Anatomic diagnosis: hydrosalpinx, twisted. Seat of tumor, left; size of orange. Tubal localization external portion. Form, pear-shaped, nodular. Twists,  $3\frac{1}{2}$ , directly. Contents, blood. Ovary, twisted. Objective signs: resistant tumor, abdominopelvic (posterior culdesac). Subjective conditions: menstruated at twelve; irregular; active pains; metrorrhagia. Operation: Laparotomy; *bilateral castration*. Result: death next day. Remarks: autopsy did not reveal cause of death.

Pozzi. Note sur quatre nouveaux cas de torsion de la trompe kystique. *Comptes. rend. de la soc. d'obst., de gyn. et de pæd de Paris*, 1900, II, 95. (This is same as case in *Rev. de gyn. et chir. abd.*, 1900).

Case I.—Æt. thirty-nine. II-para. Miscarriage, none. Clinical diagnosis: Salpingitis cystica, prolapsed in Douglas. Subjective conditions: pains in lower abdomen two and one-half years. In January, 1899, continuous metrorrhagias, leucorrhea, attacks of pain, relieved by rest. End of March, during period, of severe pains subumbilical region. Nausea, vomiting, constipation; distention of abdomen. Admitted March 14, 1899. Objective findings: uterus forward; tumor size of fist, posterior culdesac. Operation: pyosalpinx, right, ruptured during removal; size of mandarin. Pedicle twisted twice. Ovary, necrotic. Opposite adnexa. Microcystic degeneration of ovary; tube normal. Result: cure. Remarks: appendix could not be found; probably had become necrotic and sloughed off in tubal mass. Origin of pyosalpinx, probably from appendix.

Case II.—Æt. thirty-seven. III-para. (Placenta previa with first.) In 1891, metritis following chilling during menstrual period. In 1894, evacuation by "subperitoneal laparotomy,"



without opening peritoneum, of a quantity of pus, from left iliac region. Regained health. December, 1899, fever, vomiting, pain mid-point between umbilicus and anterior superior spine. Tumor size of mandarin at McBurney's point. Vaginal examination negative. Clinical diagnosis: appendicitis. First operation, January 1, 1900; cystic right size of orange, twisted once from behind forward; in handling, ruptured. Contents, viscid hemorrhagic fluid mixed with pus. Appendix intact. Opposite adnexa not examined (right ovary also twisted, remained with tube). Convalescence normal till January 11. Pain left iliac region, beneath scar of operation in 1894, fever. Second operation January 14, 1900. Left iliac incision. Pus cavity adherent to scar. Pyosalpinx blackish in color, twisted once, from behind forward. Ovary carried down and forward; tube up and backward. Resembles adnexa of opposite side. Removed tube and ovary. Result: cure.

*Case III.*—Æt. thirty-three. I-para (forceps). Subjective conditions: metritis at age of twenty-eight, from time to time, thereafter, attacks of pain (tubal colic), lasting two weeks, not at menstrual periods. January, 1900, very severe pains in lower abdomen. From then on, several attacks of abdominal pain, and constant bleeding up till operation. Objective findings: cervix large, soft, patulous. Uterus large; to left and in front of uterus a cyst size of fetal head; on right, slight induration. Clinical diagnosis: ovarian cyst, left; salpingitis, right. Operation: April 2, 1900. Large tumor resembling ovarian cyst found on left side, but pedicle arises from right, enormously dilated tube, weighs 300 gm., twisted once reversely to hands of watch. Ovary sclero-cystic. Contents, fetus 3 1/4 m.; dead, not macerated. Opposite adnexa. Ovary, normal. Tube, hydrosalpinx. Salpingostomy. Result: cure.

Praeger, J. Ueber Stieldrehung der Eileitergeschwülste. *Arch. f. Gyn.*, Bd. 58, 1899, p. 579.

*Case I.*—Æt. twenty-two. No pregnancies. Suffered with delayed menses and distress in lower abdomen, July, 1897. In October, 1897, ovarian tumor diagnosed; acute attack April, 1898, vomiting, constant and severe pain. Operation three months later. Clinical diagnosis: adherent ovarian or tubal mass. Left ovary and tube removed; right ovary resected; right tube opened. Left side affected. Ovary involved. Right side affected involved in hematocele. Adhesions all around. Diagnosis: hydrosalpinx twisted twice, in direction of hands of watch. Dark red color; hemorrhagic infiltration.

*Case II.*—Æt. thirty-five. One child. Acute pain in lower abdomen, February, 1898. Tumor in left abdomen found. No pain to February, 1899; thereafter, amenorrhea for twelve weeks; severe pain; constant vomiting; retention of urine. After eight days normal. Since then, great tenderness over abdomen; tumor reaching to navel on left. Clinical diagnosis: left ovarian cyst

with torsion. Operation, February 23. Left side affected, ovary not involved. Tumor measures  $10 \times 10 \times 7$  cm. Right side, normal. Diagnosis: hydrosalpinx twisted twice in direction of hands of watch. Contents, blood and bloody masses; hemorrhagic infiltration.

Ries. Spontaneous Amputation of Both Fallopian Tubes. *Amer. Gyn. and Obstet. Jour.*, April, 1900, p. 325.

Æt. thirty-two. Married. One child eleven years ago; two miscarriages, one twelve and one eight years ago. Ailing since first confinement. Attack of severe pain four years ago; in bed a week. Clinical diagnosis: inflamed right adnexa; vaginal section; both sides tubal stumps attached to uterus. Remainder of right tube consists of right hematosalpinx, size of goose egg. Universal adhesions. Both ovaries removed, but normal, except adherent. Diagnosis: right hematosalpinx. Amputated spontaneously by torsion. Serous bloody fluid; normal tube amputated on left. No trace of tube beyond twist.

Ross. Twisting of the Fallopian Tube with Gangrene, without Implication of the Ovary. *AMER. JOUR. OBSTET.*, liv., 1906, p. 653.

Æt. (?). Married. Clinical diagnosis: acute appendicitis. Pain began after cranking automobile. Emergency operation. Right side affected. Left tube tuberculous. Diagnosis: Pyosalpinx twisted one and one-half times. Ovary, normal. Right tube proved to be tuberculous.

Rouffart, E. Un cas de pyosalpinx tordu observation. Piece anatomique. *Bull. Soc. Gyn. and Obstet.* Brussels, 1900, tom. x, No. 10, p. 257.

Case I.—Æt. forty. II—para, last eighteen months previous. Diagnosis: Retroversion of uterus. Seat of tumor, left, size of orange. Tubal localization, external portion. Color, blackish. Size, engorged intestinal loop. Left side affected. Contents, pus. Retroposition of uterus. Adhesions: Rectum and lower portion ileum. Ovary not twisted. Opposite adnexa, tube adherent to rectum. Pyosalpinx. Objective signs: Cervix patulous; retroversion. Tumor anterior to left of uterus, fluctuating. Subjective conditions: menstruation began at ten years; regular; paroxysmal pains arising on left side. Operation: Laparotomy; supravaginal hysterectomy. Result: cure. Remarks: Fimbriated extremity of tube was carried to median line, and posterior surface of tube adherent to anterior surface of uterus.

Rouffart. Tubentorsion gefolgt von völliger Trennung. *Jour. med. de Bruxelles*, 1900. N. 12. Ref. *Zent. f. Gyn.*, 37, 1900, p. 975.

Æt. twenty-six. I—para. Complete separation outer part of right tube, as a consequence of torsion, probably a previous

hydrosalpinx, separated part, adherent and parasitic: ovary adherent. Left parovarian cyst.

Sänger. Ueber hämorrhagische Tubennekrose. *Zent. f. Gynak.*, 1893, Nr. 31, p. 727.

Æt. thirty-nine. No children. For some time irregular menorrhagia and metrorrhagia. Acute pain in left adnexa. Operation after two months; no fever; vomiting. Both sides removed. Left side affected. Right side inflamed; small hydrosalpinx. Diagnosis: hydrosalpinx; mass size of an apple; bilateral adhesions; hemorrhagic infarction from obstructed circulation. Contents, blood, fluid dark. Sänger attributed hematosalpinx and hemorrhagic necrosis in this case, to the action of adhesions and torsion.

Siredy. *Compt. rend. de la soc. d' obst. de gyn. and de pæd. de Paris*, 1906, viii, 150.

In discussion of Martin's (Rouen) case, reports the following. Patient (age not given) had no symptoms whatever from genital tract. Was at a watering-place, taken with enteritis; the local physician found by accident, a tumor size of adult's fist in left side. Patient had no pain or symptoms whatever but subsequently decided to be operated on. At operation, a cystic hydrosalpinx with thin walls, twisted twice, was found.

Stark. Acute Torsion of Normal Appendages with Hematosalpinx. *Jour. Obst. and Gyn. of the British Empire*, 1911, 19, p. 258.

Æt. forty-six. Unmarried. Attacks of pain for nine months. Clinical findings (virgin): to right of uterus, tense firm body, size of ordinary tomato; on left side, marked enlargement of the tube. At operation, blood clots in lower abdomen; on left hematosalpinx twisted three times. Ovary closely applied to tube. Right dermoid cyst, intraligamentous.

Stolz. Beitrag zu den cystischen Bildungen an der Tube. *Monats. f. G. u. G.*, Bd. x, 1899, H. 2, p. 175.

Æt. twenty-three. Single. Left side affected. Cystic tumor of the tube arising from adherent folds of mucosa; three-quarters liter of clotted blood and reddish-brown fluid. Right side normal, left behind. Diagnosis: cyst of tube; diameter about 12 cm.; twist, 540; slow torsion.

Storer. Bilateral Torsion of the Fallopian Tubes. *Bost. Med. and Surg. Jour.*, 1906, cliv., No. 11, p. 285.

Æt. Twenty-nine. Married six years. No pregnancies. No history of gonorrhea. For a year dull pain in left side; recently pain before menstruation. Clinical diagnosis: left salpingitis; right hydrosalpinx. Both sides affected; right side no strangulation; left side decided strangulation. Hemorrhagic infiltration and infarction on left side. Neither ovary involved. Diagnosis:



hydrosalpinx (bilateral); right twist  $360^{\circ}$  follow hands of watch; left hydrosalpinx twisted  $180^{\circ}$ , opposite to hands of watch.

Stratz. Akute Stiehdrehung einer Hematosalpinx. *Zent. f. Gynak.*, 1907, Nr. 31, p. 1444.

Æt. thirty-six. III-para, lastt twelve years ago. February, 1906, after moving, profuse bleeding and pain in right side. Clinical diagnosis: right tubal enlargement; hydro- or pyosalpinx, or tubal pregnancy. Operation: March 22. Right side affected; left side, normal; from clinical examination, nothing said of it at operation. Diagnosis: hydrosalpinx twisted forward over round ligament, and adherent above bladder. Contents partly pus. Microscopic diagnosis: chronic salpingitis with torsion and formation of hematosalpinx. Bluish-red tumor. No mention of tuberculosis or other infection.

Stroganoff. *Wratch*, 1893, p. 1095. (From Praeger).

Right side affected. Ovary cystic. Diagnosis: adenosarcoma of tube; twisted once, to right.

Taylor. Cyst of Fallopian Tube with Twisted Pedicle. *Trans. Brit. Gyn. Soc., Brit. Gyn. Jour.*, B., ix, 1893-4, p. 418.

Æt. thirty. Married at nineteen; child at twenty. Had retroflexion and sterility for seven years. Dr. Taylor did Alexander operation, the patient shortly after became pregnant and was confined at term. Two or three months after, had abdominal pain, and tumor found. No record of histological examination. Possibly a cyst of tube, but he says presumably a hydrosalpinx with twisted pedicle.

Veit.—Ueber Hematosalpinx. *Verh. d. d. Ges. f. Gyn.*, iv, 1891, p. 216.

Æt. twenty-seven. Three children. Suffered since last labor two years previous. Sudden attack, severe pain in abdomen; seven weeks after first attack, another; four weeks later, a tumor, reaching to navel, was found. Right side affected. Clinical diagnosis: torsion; ovarian cyst. Anatomic diagnosis: hydrosalpinx twisted, filled with blood.

Voigt. Stiehdrehung einer ungewöhnlich grossen Hydrosalpinx bei einer Sechzigjährigen. *Der Frauenarzt*, 1909.

Æt. sixty. Tumor noticed for some time; full feeling in abdomen; acute pain and tenderness. Clinical diagnosis: large, unilocular ovarian cyst; twisted pedicle; size of man's head; marked abdominal enlargement, somewhat more to left side, and within three fingers' breadth of lower border of ribs. Left side affected. Anatomic diagnosis: hydrosalpinx twisted two and one-half times to the left; 4 liters yellow, clear, straw-colored fluid; tumor has a dark blue color from hemorrhagic infiltration.



Waldo. Sactosalpinx Hemorrhagica. AMER. JOUR. OBST., Aug., 1901, p. 179.

*Case I.*—Æt. seventeen. Acute attack; previously good health. No illness before, except measles and whooping-cough. Operation after two days. Clinical diagnosis: acute appendicitis (?). Fever; rapid pulse; tumor in right iliac fossa; vomiting. Right side affected; left side, normal. Diagnosis: hydrosalpinx twisted three times; completely strangulated; no ligature needed to control bleeding from pedicle; no villi or decidua.

*Case II.*—Æt. twenty-six. Married four years; never pregnant. Well until three months previous. Since then, pain low down on left side. Fever; increased pulse; pain over entire lower abdomen, especially left. Abdominal tumor, immovable, but slight fluctuation, reaching from symphysis nearly to umbilicus. Clinical diagnosis: Inflamed ovarian cyst. Operation after two weeks. Left tube affected. Ovary, normal and right side, normal. Diagnosis: hydrosalpinx infiltrated with blood, with several distinct and complete twists. Extensive adhesions. No villi or decidua.

Ward. Twisted Pedicles. AMER. JOUR. OBST., 1910, lxii, 639.

*Case I.*—Æt. forty-seven. Married twenty-one years. No children. Sharp attack of pain in left ovarian region eight years before; occasional recurrence. Exciting cause of this attack, cleaning house and sweeping. Acute pain and symptoms of diffuse peritonitis. Clinical diagnosis: twisted pedicle of cyst. Left side affected; left ovary involved; free fluid blood in abdomen. Right hydrosalpinx; right ovary, normal. Diagnosis: hydrosalpinx twisted three times, left to right.

*Case II.*—Æt. twenty. Married four months; pregnant four months. Acute pain during pregnancy. Clinical diagnosis: acute appendix. Right side affected. Anatomic diagnosis: hydrosalpinx twisted four times, right to left. Blood-stained fluid.

Warnek. Trois cas de tumeurs des trompes de fallope avec, torsion du pedicule. Soc. d'accouch. et de gyn. de moscou. *Rev. Annal. de Gyn.*, 1894, Nr. 41, 335.

*Case I.*—Æt. forty-three. III-para, last twelve years previous. Clinical diagnosis: cyst of right ovary with torsion of pedicle left; salpingitis. Anatomic diagnosis: hydrosalpinx twisted. Seat of tumor, left. Tubal localization, external portion. Twists, 1 1/2. Contents, dark red. Adhesions between intestines and the right broad ligament. Ovary twisted. Opposite side, tuboovarian cyst twisted one and one-half times. Bilateral carcinomatous degeneration of both tubes on microscopic examination.

*Case II.*—Æt. thirty. III-para, first six years ago, last five months previous. Clinical diagnosis: pyosalpinx. Anatomic diagnosis: Hydrosalpinx, twisted. Seat, right. Size, potato. Tubal localization, external portion dilated, adherent to broad

ligament and pelvic wall; attached to inner third by a delicate band 4 cm. long, and completed twisted. Contents, outer two-thirds, clots; inner one-third, serous fluid; small abscess in wall of outer two-thirds. Opposite adnexa, healthy.

*Case III.*—Æt. forty. o-para. Clinical diagnosis: bilateral ovarian cyst with twisted pedicle. Anatomic diagnosis: Hydrosalpinx, twisted. Seat of tumor, right. Size, ox bladder (when tube was dried). Tubal localization, external portion. Form, floating kidney. Twists 4 1 2, from right to left. Contents, blood; no clots. Ovary not twisted. Opposite adnexa, tubo-ovarian cyst; intraligamentous.

Weir. Torsion of a Hydrosalpinx Resulting in Infarction. *AMER. JOUR. OF OBST.*, August, 1901, p. 529.

Æt. forty-six. Married; two miscarriages. Previously well. Acute attack; severe pain in right lower abdomen; nausea; difficult micturition. Clinical diagnosis: Ovarian cyst. Operation after five days (Dr. Robb). Right side affected. Hydrosalpinx twisted twice. Dark red color; hemorrhagic infiltration; left side tube and ovary adherent. Ovary adherent, otherwise normal.

Williamson. Torsion of the Pedicle of a Hydrosalpinx. *Trans. of the Obstet. Soc. of London*, 1905.

Æt. eighteen. Unmarried. Healthy to December, 1903; from that time to June, 1904, scanty and painful menses. June 7, severe pain in right side; later, diffuse pain; vomiting and distention. Operation after two days. Right side affected. Hydrosalpinx twisted three times, opposite to hands of watch. End of tube closed completely. Contents, blood; inner surface smooth. Ovary (right), congested, otherwise, normal.

Woolcombe. A Remarkable Case of Double Pyosalpinx with Torsion of Both Pedicles. *Lancet*, Dec. 7, 1901, p. 1584.

Æt. twenty-two. Unmarried. First attack two years before, in right lower abdomen. Repeated attacks since, last one week before admission. Abdominal tumor observed for two or three months. Right side abdominal tumor extends above the umbilicus; left side, also, abdominal tumor rising out of pelvis. Universal adhesions, but very easily separated on right. Very few on left. Diagnosis: Pyosalpinx (bilateral); right side with ovary twisted one and one-half times to left. Left side without ovary twisted twice to the right. Right tube, circumference 10 1/2 in.; extreme length 8 in.; dark bluish-red blood inside. Right ovary involved; measures 3 × 3 inches. Left tube, the bulbous part, 7 1/2 inches long. Maximum circumference 11 inches. Contents resemble cream cheese; no odor; no diplococci; no tubercles; no chorion villi or signs of new growth.

## CASE SUMMARY

Age.	Social Conditions.	Children or Pregnancies.
16-20..... 11	Single..... 13	Nulliparous..... 27
20-30..... 24	Married..... 44	i-para..... 13
30-40..... 30	Not stated.... 38	ii-para..... 10
40-50..... 13		iii-para..... 10
50-60..... 3	95	iv-para..... 3
Not stated... 14		v-para..... 1
95		viii-para.... 1
		Not stated.... 30
		95

Abdominal Tumor.	Clinical Diagnosis.
Present..... 34	Ovarian cyst twisted pedicle... 25
Absent..... 22	Pelvic inflammatory disease.... 20
Not stated.... 39	Appendicitis..... 8
95	Tubal pregnancy..... 4
	Other diagnosis..... 8
	Not stated..... 30
	95

Period of Observation before Operation.	Side Affected.
Less than forty-eight hours..... 9	Right alone..... 49
Less than two; weeks..... 10	Left alone..... 31
Over two weeks..... 56	Both..... 7
Not stated..... 20	Not stated..... 8
95	95

Condition of the Opposite Adnexa.	Ovary of the Affected Side.	Number of Twists.
Healing..... 20	Involved..... 27	Less than one. 8
Diseased..... 44	Not involved.... 34	One..... 20
Not stated.... 31	Not stated..... 34	Two..... 23
95	95	Three..... 18
		Four or more.. 6
		Not stated.... 20
		95

## Color of Tumor.

Bluish black..... 66
Inflamed and red..... 10
Yellow..... 1
Clear and translucent..... 1
Not stated..... 12
—
95

## Pathological Diagnosis.

Hydrosalpinx..... 62
Tubal pregnancies..... 5
Carcinoma or sarcoma..... 2
Cystic tumor of tube..... 2
Pyosalpinx..... 12
Other diagnosis..... 12
95

A STUDY OF TWO HUNDRED AND TWELVE CASES OF  
CANCER OF THE UTERUS WITH SPECIAL REFER-  
ENCE TO EARLY DIAGNOSIS.\*

BY

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THE cause of cancer belongs to that large group of unsolved problems which has baffled medical science in every attempt to find a solution. The interest in the problem does not exist because cancer is a new disease, since this disease is as old as the world; but the high mortality, the terrible nature of the disease, the almost uniformly bad prognosis in the past, its increasing frequency, its unsolved etiology—these factors have been sufficient to keep the question continually before the medical profession.

As long as the cause of cancer is unknown, prophylaxis or treatment cannot be said to follow along rational lines. But while laboratory workers and clinicians are endeavoring to ascertain the cause of the disease, patients with cancer are presenting themselves for treatment, and must be helped if possible whether the treatment be rational or not. Each specialty has done its share toward the solution of the problem as far as its limited field is concerned, but in no instance has the solution been reached. Thus it has fallen to the lot of the gynecologist to help solve the question of uterine cancer. The high percentage of mortality and the low percentage of cures testify to the reality of this unsolved problem.

Although cancer seems in some respects to be a disease of certain localities, no part of the world is entirely free from it. Like other diseases, cancer becomes more frequent the more diligently it is looked for and the more carefully diagnoses are made. Although certain races seem less susceptible, no race is entirely immune. Not only is cancer prevalent everywhere, but it is actually on the increase. In many countries this disease is becoming one of the great mortality producers, usually being found near the top of the mortality lists. While the frequency

\* Read before the Michigan State Medical Society at its forty-seventh annual meeting, held at Muskegon, Michigan, July 10, 1912.



of the disease has increased, the percentage of cures in most instances has not improved. However, some progress has been made, the Germans in particular having done a good work, for with them the percentage of cures has gradually increased.

In Michigan cancer is among the more common causes of death. The vital statistics compiled by the Department of State show that this disease is near the top of the mortality list. During the five-year period ending December 31, 1909, the mortality due to cancer was over 9000. Only four other diseases—heart disease, tuberculosis, pneumonia, enteritis (infantile)—caused a higher mortality. The statistics are rather incomplete, however, and it is impossible to determine anything definite concerning uterine carcinoma, since the Department of State does not compile separate statistics on uterine cancer, but includes in one group all genital carcinomata.

A comparison of the Michigan mortality statistics for tuberculosis and cancer shows some interesting facts. The mortality due to tuberculosis is only slightly higher than that due to carcinoma. During the five years ending December 31, 1909, there has been a slight (3.7 per cent.), but gradual decrease in the mortality due to tuberculosis. On the contrary, the mortality due to carcinoma has increased, not gradually, but at a very rapid rate—the increase during this time being 15 per cent. Although we are constantly reminded of the great increase of and danger from tuberculosis, we very seldom hear a similar word of warning concerning carcinoma. Furthermore, because of neglect or ignorance, the great majority of cases of carcinoma are incurable. It would seem that a disease which has so uniformly doomed its victims in the past, but which is curable in certain stages, should be given more public thought and attention than it has received.

Cancer seems to be more frequent in southern Michigan than in the northern part of the State. In fact the number of cases of cancer per thousand population gradually increases as one goes from northern Michigan to the extreme southern counties. In this respect the statistics are just the opposite of those for tuberculosis, where the smaller number of cases per thousand population are found in the southern counties, and the rate gradually increases as one goes north, and is greatest in the upper peninsula. Several explanations have been offered, but none is very satisfactory. The question of race or nationality will largely explain the distribution of tuberculosis. It has been suggested that

cancer is a disease of civilization, and possibly this explains its increased frequency in the more thickly settled portions of the State. However, no definite proof of this has been presented.

As stated before, we have no means of determining the exact frequency of carcinoma of the uterus in this State. We can, however, get some idea as to its relative frequency as compared with other gynecologic diseases. During the last ten years about 5300 patients applied for treatment in the University of Michigan Gynecologic clinic and in the Private Hospital of Doctor Reuben Peterson, and practically all suffered from gynecologic complaints. Of these patients, 212 had some form of uterine carcinoma. From these statistics alone it would be fair to conclude that about one in every twenty-five gynecologic patients has carcinoma of the uterus—a percentage of four. Just what proportion of the entire female population is afflicted with uterine carcinoma it is impossible to state.

Clinically, uterine carcinoma can be classified into two groups—(1) carcinoma of the cervix and (2) carcinoma of the fundus. These are distinct clinical varieties, and as they differ so much in prognosis and in treatment the distinction should always be borne in mind. Carcinoma of the cervix is more frequent, occurring 176 times in 212 cases (83 per cent.), while carcinoma of the fundus occurred only about thirty-six times, or in about 16 per cent. of all cases.

Clinically, carcinoma of the cervix may occur in various forms, the picture in most cases depending on the stage of the disease. One form which unfortunately does not cause enough symptoms to alarm the patient, and for that reason is not often recognized, shows a hard, thickened, indurated, friable cervix, but without much destruction of tissue. This picture represents the earliest form of the disease. Another form is the proliferating variety where the cancer juts out from the cervix and extends into the vagina, which it may entirely fill. This tumor is usually spoken of as a "cauliflower" growth, a term in every way fitting. A third clinical form presents an excavated cervix, with marked destruction of tissue. Often the cervical rim is entirely destroyed, merely an excavation marking the former site of the cervix. Without doubt many of the cauliflower growths at a later stage, when degeneration has occurred, would show this "crater" form.

The clinical or gross picture of carcinoma of the fundus is usually that of a fungous growth replacing the endometrium.

At times the entire endometrium may be involved. Rarely the fungous growth is attached over a small area only, somewhat like a polyp.

Microscopically there are also various forms of carcinoma of the uterus. Carcinoma is an epithelial growth and as the uterine fundus contains only one kind of epithelium, we have here only one type of carcinoma. It arises from the epithelium of the endometrial glands and proliferates by forming gland-like extensions. This form is known as "adenocarcinoma" of the fundus or endometrium. In the cervix we find two kinds of epithelium, stratified squamous epithelium covering the portio vaginalis, and tall columnar cells lining the cervical canal and its glands. These columnar cells may be affected by carcinoma, with resulting proliferation similar to carcinoma of the fundus, producing an adenocarcinoma of the cervix, extremely malignant, but fortunately very rare. The more common form of cervical carcinoma arises from the stratified squamous epithelium, and is known as "squamous celled" carcinoma. In certain cases these tumors seem to proliferate from the deeper or basal layers of the epithelium, rather than from the flattened squamous cells. This form is spoken of as "basal celled" carcinoma. These two forms arise in the same tissue, all authors not recognizing the distinction, which is microscopic and dependent on the form of the cells constituting the neoplasm.

As a basis for this paper, a study has been made of 212 cases of cancer of the uterus treated in the two clinics mentioned above. These cases have been compiled and a study made of the relation of carcinoma to age, menopause, parity, heredity, etc.

In the present series of cases the age at which the carcinoma developed could be definitely determined in 211 cases. The average age for the whole series was forty-eight years. However, the age limit is wide, the youngest patient being twenty-six, and the oldest seventy-five years of age.

A separate classification was made of the cervix and fundus cases. The age could be determined in 175 cases of cancer of the cervix. The youngest patient was thirty-one years of age and the oldest was sixty-nine years. The average age was 47.2 years.

TABLE I.—AGE STATISTICS.  
CARCINOMA OF CERVIX.

Age,	34	35-44	45-54	55-64	65-74
Number of cases,	17	59	59	34	6
Percentage in each decade,	10	33	33	20	3

As shown in Table 1, the number of cases at either extreme of this age limit is small. Two-thirds of the cases occur in the two decades between thirty-five and fifty-five years of age. It is not quite so common in later life.

The age was determined in all the thirty-six cases of carcinoma of the fundus. As shown in Table 2, the disease may occur at almost any age, the youngest patient being twenty-six and the oldest seventy-five years old. The average age is fifty-two years, this being five years older than the average in cancer of the cervix. The decades beginning with thirty-five, forty-five and fifty-five years of age each furnish about the same number of cases. The majority of these (57 per cent.) occur between forty-five and sixty-five years of age, which is a later period than the majority in cancer of the cervix. It cannot be said that adenocarcinoma of the fundus is more common in later than in earlier life. In fact, in this series it is more common in patients between thirty-five and forty-five than in those between sixty-five and seventy-five years of age. It would be more correct to say that adenocarcinoma of the fundus develops through a longer range of years than carcinoma of the cervix. More patients of advanced years are afflicted with it than with carcinoma of the cervix, and

TABLE 2.—AGE STATISTICS.  
CANCER OF FUNDUS.

Age,	34	35-44	45-54	55-64	65-75
Number of cases,	1	9	10	11	5
Percentage in each decade	3	25	27	30	14

this raises the average age. But it is wrong to assume that younger patients are not subject to this form of carcinoma. The number of cases of carcinoma of the fundus is distributed quite evenly between thirty-five and sixty-five years of age.

The relation of child-bearing to cancer of the uterus has been frequently discussed. In the series of 212 cases, twenty-three had never given birth to a full term child, although four of them had had early abortions. This means that 189 patients, or 89 per cent. of the series, had been delivered of full term children. Statistics like these have given support to the opinion that the trauma of labor stands in some etiologic relation to carcinoma of the uterus.

Of the 176 patients with cancer of the cervix, 163 or 93 per cent. had had children. It will be noted that the percentage of patients without children is considerably larger in patients with cancer of the fundus (27.7 per cent.) than in patients with



cancer of the cervix (7 per cent.). From this alone it may be assumed that child-bearing does not stand in such close relationship to carcinoma of the fundus as it does to carcinoma of the cervix. The question of sterility should be considered in this connection. Of the thirteen nulliparæ among patients with

TABLE 3.—PARITY—CANCER.

	Carcinoma. Uterus	Carcinoma. Cervix	Carcinoma. Fundus
Number of cases. ....	212	176	36
Number without children. ....	23	13	10
Percentage, no children. ....	11	8	27.7

cervical cancer, nine had been married over a long period of years without becoming pregnant. Of the other four nulliparæ, three had had miscarriages and one had married late in life. Of the ten nulliparæ among the patients with cancer of the fundus, three were married for a long time without becoming pregnant, four were single, two had had miscarriages, and one had married after the menopause.

The above statistics show that undoubtedly carcinoma is more likely to occur after childbirth, and this is especially true of carcinoma of the cervix. But it is also very evident that carcinoma of both the fundus and the cervix may develop in women who have never given birth to children or who have never been pregnant.

From the patient's viewpoint the menopause or change of life means a cessation of the menstrual flow. Although an important incident, we know that the cessation of menstruation is only one of the phenomena of the menopause. Often we see patients who have the nervous and other manifestations of the climacteric but still have a bloody discharge, not infrequently due to disease. Such patients do not consider they have had the change of life. In this series of cases, we will, however, consider the cessation of menstruation as the criterion of the established menopause. Information concerning the menopause was obtained in 208 cases. It was found that the disease had started before the menopause in 126 cases (60 per cent.). In the remaining eighty-two patients the carcinoma first produced symptoms after there had been a definite cessation of the menstruation due to the menopause..

TABLE 4.

Menopause not begun.	1-5 years.	Postmenopause		
		6-10 years.	11-15 years.	16-20 years.
	All cases (268)			
126	24	22	22	14
60 per cent.	Cervix cases (172)			
	19	17	17	9
110	Fundus cases (36)			
16 (44 per cent.)	5	5	5	5

This is a very important point to consider as it affects directly the problem of early diagnosis. The patient has a very indefinite idea as to what the change of life means, and any menstrual irregularity, whether it be a decrease or an increase in the flow is ascribed to the change of life. Table 4 shows that 60 per cent. of the patients with carcinoma of the cervix do not have the cessation of menstruation due to the menopause. The disease develops and keeps up some bloody discharge at the time when the menopause should occur with the patient blissfully ignorant of the true state of affairs. It is not until there is a constitutional breakdown that the patient gives the matter any serious attention. In the 40 per cent. of cases where the symptoms begin after a definite amenorrhea due to the menopause, the patient is more likely to be alarmed and relief is sought at an earlier stage.

It will be seen from Table 4 that more cases of cancer of the cervix (64 per cent.) begin before the menopause than do cases of cancer of the fundus (44.4 per cent.). This is due to the fact that more cases of cancer of the fundus begin late in life.

The majority of all cases of carcinoma of the uterus are inoperable when the patients apply for relief. The operability depends on the extent of the involvement. The duration of the disease is not an exact criterion, although it is in a general way. Patients who have had symptoms for a year or two are usually beyond surgical relief. Occasionally, however, a slow growing carcinoma may be operable even after a longer period. The operability must be determined by bimanual examination. If the cervix is firmly fixed in the pelvis and the fundus and appendages cannot be felt because of the induration of the vaginal

vault, a curative operation is out of the question. If, however, the local disease is limited to the cervix the vagina is free and the uterus is freely movable, then the patient still has a chance for a cure. In such a case an exploratory operation is always advisable.

In carcinoma of the fundus there may at times be considerable involvement of the endometrium with marked enlargement of the uterus, still the case be distinctly operable. This variety of carcinoma is usually of slow growth. The mobility of the uterus will determine the operability. In advanced cases where the uterus is fixed and ascites has developed, operation is out of the question.

In trying to make a classification of cases according to the clinical picture presented, 158 cases were available for classification. The three stages mentioned were recognized. Thirty patients showed the enlarged, thickened, indurated and friable cervix without much loss of tissue, and were considered favorable cases for operation. In eighty-seven patients carcinomatous crater or excavation was seen. The cauliflower mass was observed in forty-one cases. It will be noticed that the most common clinical picture is the excavated cervix or vaginal vault, and unfortunately this represents the more advanced stage of the disease. Of the 212 cases, fifty-three cases or 25 per cent. were considered operable and were subjected to the radical operation. The remaining 75 per cent. were beyond cure and only palliative operations could be performed.

A great difference of opinion exists as to the influence of heredity in the development of cancer of the uterus. W. Roger Williams has collected statistics on this subject and found that there is a family history of cancer in 19.7 per cent. of all patients with cancer of the uterus. The percentage is slightly higher in patients with cancer of the breasts. In his entire series of female patients, there was a history of heredity in 22.4 per cent. of all cases. In a series of 101 women with nonmalignant tumors the same writer finds a family history of cancer in 15.8 per cent. of the families. This slight difference, he presumes is evidence of the heredity of cancer. Cullen, in a series of seventy-four cases of cancer of the uterus found a family history in about 19 per cent. and concludes that heredity plays a minor rôle in the development of cancer of the uterus.

In the series under consideration there was a definite record as to the family history in 192 cases. Of these twenty-nine

showed a family history of carcinoma, a percentage of about sixteen. For the purpose of comparison, the family histories of 100 gynecologic patients free from malignancy were investigated. In this series, taken consecutively, 22 per cent. of the cases showed a family history of cancer. The fact that in patients with carcinoma the percentage of these with family histories of malignant disease was less than in gynecologic patients without carcinoma, certainly would not support the theory that cancer of the uterus, at least, is hereditary.

The symptomatology of uterine carcinoma is fairly distinctive in most instances. In 194 cases in this series, there was a definite record as to the earliest symptoms and the course of the disease. In 142 cases, or 73 per cent., the earliest evidence of the disease was the occurrence of a bloody vaginal discharge. The nature of this bleeding varied a great deal and almost every type of hemorrhage was recorded. In many instances it first appeared as an increase of, or a prolongation of the normal menstrual discharge. Patients with a period of four days' duration had a gradual lengthening of the period up to ten or fourteen days. In many cases the flow was continuous, the patient losing all track of her normal periods. In nearly all cases an intermenstrual bloody discharge appeared early in the disease. In most cases this was very slight amounting in many instances to nothing more than an occasional stain. But even in these cases where the amount of blood lost was small, the flow was frequent and easily produced. It was not uncommon for a slight bloody discharge to appear after coitus or after the use of a vaginal douche. Likewise any exertion or jarring would give rise to a stain of blood on the napkin. In several patients this show of blood appeared during or after straining at stool.

But as mentioned before there was a great variation in these types of bleeding. In a few patients the first evidence of something wrong was a sudden gush of blood from the vagina. In a few where this occurred, there were no further symptoms for a considerable length of time. In others the bleeding was continuous and severe and in a very short time caused a marked secondary anemia.

The bloody discharge was followed in most cases by a watery discharge which often contained bits of necrotic tissue. In nearly all cases where enough time had elapsed since the beginning of the bloody discharge a foul watery discharge, due to the presence of necrotic uterine tissue appeared. It seemed to come



earlier in cases where the hemorrhage started profusely. The discharge at first was very often clear, watery and odorless but after secondary infection occurred it became foul and thick in consistency.

In most cases pain was a late symptom, and occurred in advanced cases. The type of pain varied a great deal, some patients complaining of a bearing down pain in the abdomen and others simply of a suprapubic tenderness. Many patients had a very intense sacral backache. Pain radiating to the hip and down the thigh was also very frequent. The pain in most cases was very severe, often of a "grinding" or "boring" character rather than sharp. Although the pain occurred at all times, more frequently, it began toward evening and lasted well into the night. In some of the advanced cases drugs were powerless to control the pain.

In forty-one cases the first symptom observed was a leucorrhœal discharge. In these cases there usually was no profuse hemorrhage, although the discharge later showed some color, or became blood-streaked. A few patients asserted that they had never had any abnormal bloody discharge.

As stated before, pain is a late symptom of uterine cancer. Eleven patients, however, gave pain as their first symptom. Pain may occur early, but in such cases it is always a question whether it may not be caused by some lesion other than carcinoma.

It is impossible to differentiate between carcinoma of the cervix and carcinoma of the fundus from symptoms alone. It has been said that a clear watery discharge is characteristic of carcinoma of the fundus, but in these cases no such distinction could be made. Only by a pelvic examination could one differentiate the cases. A striking difference, however, was the fact that in carcinoma of the fundus local symptoms existed for a much longer time than in cervical carcinoma without producing constitutional effects.

The rather infrequent occurrence of cachexia in these cases is worthy of note. It emphasizes the fact that cachexia and loss of weight are not only not essential to carcinoma of the uterus but that one must not wait for their development to make a diagnosis. It is not uncommon for patients to say that they are even gaining in weight. Many patients put on flesh at about the menopause, and one must not take this as an assurance that no malignant disease exists. If the patient's freedom from disease be

judged by her flesh alone, valuable time may be lost before the true diagnosis be made. In fact excessive flesh is a distinct disadvantage to patients with carcinoma of the uterus since it may be enough to turn the scale in favor of a mere palliative operation in a border-line case, where in the case of a thin patient, the radical operation would have been attempted with some hope of success.

The treatment of carcinoma of the uterus may be divided into (1) curative and (2) palliative. When the cause of cancer is discovered we may be able to cure more patients. Until then we have no alternative but the knife. When another method of cure is discovered, no matter what it is, the gynecologic surgeon will only be too glad to turn over these patients to the cancer specialist.

Of the 212 cases, fifty-three or exactly 25 per cent. were subjected to the radical abdominal operation. This does not mean that the surgeon was confident of an absolute cure in each case. It signifies, considering the extent of the disease, that each case was thought worthy of the trial.

The radical abdominal operation for carcinoma of the uterus consists of the complete removal of the uterus and the parametrium with a cuff of the vagina, together with both tubes and ovaries. The operation also includes the removal of enlarged pelvic glands whenever this can be done without too seriously endangering the life of the patient. The operation is a serious one, and is distinctly an operation for the specialist. A mortality of about 25 per cent. among these fifty-three cases testifies to the severity of the undertaking. However, with a goodly number of patients alive and free from recurrence from five to nine years after the operation and with other patients living who promise to do equally well or better, one feels encouraged even though the undertaking is desperate. The operation gives the patient her only chance for a complete cure, and for this reason the opportunity must not be denied her if there be a chance for success.

The results of the treatment of carcinoma of the fundus are somewhat more hopeful than that of carcinoma of the cervix. In most cases the disease advances slowly with the result that only late in the disease are the lymphatics involved. The ordinary panhysterectomy will give good results in nearly all cases.

Three-fourths of the 212 cases were so far advanced as to contraindicate the radical operation. Hence the treatment

employed was necessarily only palliative. When a patient presents herself for treatment with gradually decreasing strength from continual bleeding; is a nuisance to herself and friends; when she is weak, anemic, and septic; when there is loss of appetite and numerous other complaints,—it is remarkable how well she will respond to palliative treatment. A short period of rest in bed, with good food and some form of iron will usually bring up the hemoglobin very rapidly. Then when it is safe to give an anesthetic, the necrotic, infected, carcinomatous growth should be curetted away. The actual cautery can be used here to good advantage. The application of a strong corrosive, *e.g.*, gauze soaked in 50 or 75 per cent. zinc chloride solution, will usually result in a slough of the necrotic tissue and leave a clean granulating surface. The bleeding will then stop for a while and the discharge will disappear. Septic absorption will cease, the patient's color will improve, her appetite will return, she will be relieved temporarily of her pain, and in all respects will be much improved. Of course the improvement is only temporary and sooner or later her old symptoms will return because only a portion of the diseased tissue has been removed.

The duration of the disease varies with the different types of carcinoma. In general, patients with cancer of the fundus live much longer than those with cancer of the cervix. It is not uncommon for the former type of patients to live four or five years. On the other hand, the cases in this series with cancer of the cervix very seldom lived beyond three years, and it was more common to see a fatal end after about two years. A few unusual cases may be mentioned; one a patient with basal-celled carcinoma of the cervix who first appearing in the clinic fifteen years ago, has returned several times since. She returned last two years ago, and when heard from a year ago was still alive. Another patient who entered the clinic eight years ago with an inoperable squamous-celled carcinoma of the cervix was still alive and fairly well two years ago. Naturally these cases are exceptions to the general rule.

Since only a comparatively few patients with inoperable carcinoma died in the hospital, the records are naturally very incomplete as regards the cause of death. Although the date of death is recorded in some instance, the terminal cause is not given. Judging from the somewhat meager records in this respect it would seem that patients with cancer of the uterus who do not die from some terminal infection are more likely



to succumb to uremia than any other cause. The uremic condition is simply secondary to an obstruction of the ureter with resulting hydronephrosis. Fatal hemorrhage is apparently a very rare occurrence in carcinoma of the uterus.

With our present knowledge of the treatment of uterine carcinoma, the only hope lies in a positive early diagnosis. In some diseases in which the true diagnosis may be suspected early it is often proper to adopt expectant treatment and allow further observation to establish fully the diagnosis. When dealing with uterine carcinoma, however, expectant treatment is nothing less than criminal. The patient loses her only chance while we wait for the other clinical symptoms to establish the diagnosis.

Occasionally we will find that a uterine carcinoma is well advanced and the case hopeless when the first symptom appears. But, fortunately, nearly all cases give warning at an early stage, and if the warning be heeded, many more patients can be saved. One is often appalled by the large number of inoperable cases of uterine carcinoma, and the question naturally arises as to why the diagnosis is not made earlier. In answering this question we must consider it both from the standpoint of the physician and the patient.

There is a general feeling of skepticism among the profession as to the end results of surgical treatment for cancer of the uterus. Many a doctor has expressed his sincere doubts as to the advisability of attempting to cure cancer of the uterus by surgical means, hence he does not realize the importance of the early diagnosis. We must first of all convince such a practitioner that cancer of the uterus has been and is being cured by operation. He will perhaps relate various cases where the patient had a recurrence after a vaginal or abdominal hysterectomy. However, he must be shown that with the development of the radical abdominal operation as first practised by Wertheim, a new era has been introduced, and that with the proper kind of cases, cancer of the uterus can be cured. The practitioners skepticism, sincere though it be, robs many a patient of her only chance of cure.

Delay in making the diagnosis when cancer of the uterus is suspected may mean an inoperable case when at last it reaches the surgeon's hands. There is but one remedy for this,—the physician must be impressed by the importance of early diagnosis, and must know how to make it. He must look with suspicion on any increase in bleeding in a woman approaching



the menopause. It is true that many women bleed more freely for a short time just before the cessation of the periods. In most cases an increase in flow at the change of life, no matter how slight, means disease, and in many instances the serious disease under discussion. When the patient comes to us because of bloody discharge, whether it be menorrhagia or metrorrhagia, profuse or slight, we should look upon the condition as suspicious and judge it to be malignant until it be proved otherwise, nor should time be lost in determining the nature of the lesion. As we cannot differentiate in a clinical way, our only recourse is to a microscopic examination. If the cervix looks suspicious we should remove a piece for diagnosis. If the cervix appears normal the uterus should be curetted, and the specimens removed should be sent at once to a competent pathologist. After we have done this and have done it quickly, then and only then can we feel assured that we have done our duty by our patient. No doubt many excisions will be made without discovering carcinoma, but every time we find an early case we will feel repaid for our efforts.

In most cases the failure to make an early diagnosis cannot be laid at the door of the physician. The physician is helpless if the patient does not present herself for treatment. Although there is a general feeling among the laity that the change of life is a trying time for the woman, the ideas as to what should normally happen at this time are very indefinite. Almost invariably when asked why she did not consult her physician earlier, the patient replies that she thought the hemorrhage to be due to the change of life and therefore to be endured. The patients realize that they should eventually cease flowing, but consider it a normal occurrence to have this preceded by a period of excessive or irregular loss of blood. It is true that this does occur in some women who do not develop cancer, but there is no way of being sure unless every patient with irregular bleeding be curetted for microscopic diagnosis. It is absolutely essential that patients should be taught that the change of life means lessened flow, and that any increase in flow at this period may mean disease, and that it demands immediate and thorough investigation.

If the physician is on the alert and patients are trained to report the first symptoms, will it then be possible to save all patients with uterine carcinoma? Unfortunately, no, but we will then save many more than we do now. Several patients in the series were cognizant of the possibilities and reported to

their physicians, who at once recognized the condition as far advanced carcinoma. One patient in particular was in the hands of the gynecologist within two weeks after the first symptom, only to find that the disease was inoperable. Fortunately such cases are exceptions.

The whole question of early diagnosis of uterine cancer then is one of education. We cannot emphasize this too strongly. This education must reach both the profession and the laity. It will require time and repeated effort, but it must be done. We can do for cancer what has been done for tuberculosis. Information should be distributed by pamphlet or reprint, rather than through the medium of the newspaper. It can be done in a quiet way with no resulting hysteria. The day surely will come when 75 instead of 25 per cent. of cases will be operable. Instead of curing 50 per cent. of those operated, 80 or 90 per cent. will be saved.

#### CONCLUSIONS.

1. Cancer holds fifth place as a cause of death in Michigan.
2. During the last five years the death rate due to cancer in Michigan has increased 15 per cent.
3. Among gynecologic patients one in every twenty-five has cancer of the uterus.
4. In five-sixths of all cases of cancer of the uterus the disease is primary in the cervix, and in one-sixth of the cases it is primary in the fundus.
5. The age limit of carcinoma of the uterus is wide, from twenty-eight to seventy-five years. The average age is forty-eight years.
6. Carcinoma of the cervix occurs most frequently between thirty-five and fifty-five years of age; carcinoma of the fundus between forty-five and sixty-five years of age.
7. Carcinoma of the fundus develops over a longer range of years than carcinoma of the cervix.
8. Patients with cancer of the cervix present a history of child-bearing in 92 per cent. of all cases. Among patients with cancer of the fundus the percentage is 72.
9. Cancer of the uterus, although more common in parous women, may develop in nulliparæ.
10. Heredity has very little part in the development of uterine carcinoma.

11. Carcinoma of the uterus can be cured by operation. In order to obtain a cure, however, the diagnosis must be made early.

12. The early diagnosis of carcinoma of the uterus depends on giving close attention to the earliest symptoms. An increase in bleeding in a woman approaching the menopause demands a careful investigation and a microscopic examination of tissue from the cervix and fundus.

13. The first symptom of carcinoma of the uterus in 73 per cent. of cases is an increased menstrual or an irregular intermenstrual discharge of blood.

14. Watery and foul discharge and pain are symptoms occurring at a later stage of the disease.

15. Carcinoma of the uterus occurs in many healthy and robust looking women. Cachexia occurs only in advanced stages of the disease.

16. The radical abdominal operation offers the only absolute cure for carcinoma of the cervix. Carcinoma of the fundus can be cured by a less radical operation.

17. In inoperable cases temporary relief can usually be secured by a palliative operation.

18. Most of the patients afflicted with this disease die either from some terminal infection or from uremia.

19. To obtain earlier diagnoses the profession as well as the laity must be educated.

20. All women must be taught that the menopause means lessened flowing, and that any increase in flowing at this time may signify disease.

21. An organized campaign of education is necessary if more patients are to be saved from cancer in all its forms.

## TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.

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*(Concluded.)*

### SYMPOSIUM ON THE RADICAL ABDOMINAL OPERATION FOR CANCER OF THE CERVIX OF THE UTERUS; PRIMARY RESULTS AND END RESULTS (FIVE-YEAR LIMIT).

DR. JOHN G. CLARK, Philadelphia, spoke on the radical abdominal operation for cancer of the cervix of the uterus, based upon forty operations.

### PRIMARY AND END-RESULTS OF FIFTY RADICAL OPERATIONS FOR CANCER OF THE UTERUS.

DR. REUBEN PETERSON, Ann Arbor, in speaking of the primary results stated that in each of the fifty-one patients operated upon, the diagnosis of carcinoma of the uterus was confirmed by the microscope. Cases of cancer of the cervix and of the fundus had been grouped together and also considered separately as far as primary and end-results were concerned. While it was undoubtedly true that cancer of the fundus was much more amenable to cure by the radical operation than cancer situated in the cervix, since the latter extended much more rapidly through the parametria and lymphatics, he believed that each fundus case should be subjected to as thorough an operation as if the cervix were diseased. Notwithstanding the fact that the radical operation was apt to be easier in carcinoma of the fundus, owing to the greater movability of the uterus, there would always be a higher mortality when this technic was employed than after the ordinary panhysterectomy.

There were ten deaths in the fifty-one cases or a primary mortality of 19.6 per cent. His operative experience with the radical abdominal operation began some ten years ago, and until he had acquired some familiarity with the technic the results were very discouraging. This was shown by a primary mortality of 42.8 per cent. in the first fourteen cases. In the last thirty-seven cases there were but four primary deaths, a mortality of 10.8 per cent. That the technical difficulties of the radical operation were much greater in cancer of the cervix than where the fundus was affected was shown by the great difference in primary mortality in two types of cases. In forty cases of carcinoma of the cervix there were nine deaths or a primary mortality of 22.5 per cent., while there was only one primary death in eleven cases of cancer of the fundus, or a mortality of 9 per cent.



The high primary mortality in the first fourteen cases was due to a prolongation of the operations, together with an unnecessary loss of blood due to a failure to appreciate how venous oozing could be avoided. He found it exceedingly difficult to differentiate clinically between shock by itself, usually due to a prolonged operation, and shock due to the same cause plus hemorrhage or persistent oozing. Four of the six deaths could be ascribed to shock, one to peritonitis, and one to embolus. Since each of these causes had a direct bearing upon primary mortality in any series of radical abdominal operations, it was best to consider them separately.

Prolongation of the operation beyond the limit of safety with an operation where the work was being performed in close proximity to large vessels and important nerve plexuses, was a potent cause of shock, especially if to this be added a considerable loss of blood from venous oozing deep down in the pelvis.

Celerity in the performance of the operation came from increased experience with the technic, as was shown by the marked lowering of the primary mortality in the last thirty-seven cases of the series. These cases were of the same type as the first fourteen where the mortality was so high, yet there were only four primary deaths in the series, or a primary mortality of 10.8 per cent. While shortening the time of operation from two and a half to one and a half hours or even less in some cases, probably had much to do with lowering the primary mortality, it was by no means the only factor. As fear of wounding the ureters had stood in the way of wide excision of the parametria in the vaginal operation for cancer, so in the radical abdominal operation, fear of injuring this important duct prevented clamping of the bleeding veins. This resulted in considerable loss of blood, prolongation of the operation and resulting shock. In his experience venous hemorrhage was most frequent in three places, from the transverse vesical veins which ran across the ureter, the veins which lay in close proximity to the uterus and the ureter, and finally the veins posterior to the uterus lying in close connection with the rectum.

In the radical operation it was easier to guard against peritonitis and against shock. This was best accomplished by rendering the vaginal canal, including the cancerous cervix, as aseptic as possible, and shutting off the septic portion of the uterus from the abdominal cavity by the use of the right-angled clamps. In both the patients dying from peritonitis the pelvic cavity was contaminated by tearing through the necrotic cervix during its removal. However, this accident occurred a number of times without resulting in sepsis.

Two patients died from pulmonary emboli, one a few hours after the operation, the other on the twenty-third day, the latter originating from a septic thrombus.

While in some instances cancer of the uterus might recur five years or more subsequent to the operation, these cases were so

rare that by common agreement a patient was pronounced cured if she remained free from the disease for five years after the radical treatment of the condition. However, it must be borne in mind that in determining the number of patients permanently cured by the radical abdominal operation, it would not do to ascertain that such patients had passed the five-year period and without further investigation pronounce them cured in subsequent reports. They must be continually kept track of and their condition accurately determined before each report was made.

Only fourteen cases were operated upon more than five years ago, two more than at the time of his last report. The same statement held good now as then that in such a small series of cases percentages counted for little and were only given for the sake of comparison with subsequent reports.

Out of the fourteen cases there were six primary deaths, and of the eight surviving three had recurrences, the remaining five patients being in good health and free from recurrence five years or more after the operation. Six patients with carcinoma of the cervix survived the operation. Of these, three were alive and free from recurrence, while the two patients with carcinoma of the fundus had had no recurrence. Peterson had made a summary of the fifty-one cases, which showed that eight patients with carcinoma of the cervix had died from recurrence of the disease, while one died of tuberculosis. Two patients with carcinoma of the cervix had had recurrences, but were still living. One patient had a recurrence in the vaginal vault five months after the operation. Indurated tissue about the size of the end of the thumb was removed at a second laparotomy. Although the tissue was shown to be cancerous by a microscopic examination, the patient had been perfectly well and free from recurrence in the two and a half years elapsing since the second operation.

Since no autopsies had been performed upon any of the eight patients who had died of recurrences, it was impossible to make any authoritative statement as to the exact location of the recurrence in any case. It was impossible to state whether the disease first recurred in the vaginal cicatrix or in the glands.

From personal examinations of seven patients out of the eleven with recurrences, he was able to say that in these the disease undoubtedly returned in the vaginal cicatrix. In spite of all precautions to prevent contamination of the field of operation by gauze packing and the use of the right angled clamps below the diseased cervix and the removal of a wide margin of vaginal wall, there was still great danger of implantation metastases during the operation.

There were ten recurrences among the thirty-one cases of carcinoma of the cervix surviving the operations, while there was only one recurrence in the eleven cases of carcinoma of the fundus.

Glands were removed in twenty-nine and not removed in twenty-two cases. The excised glands were all subjected to

microscopic examination. In five cases only were metastases found. Of these five cases, one patient died from the operation; there was recurrence in three, and one patient was still living free from recurrence three years after the operation. Glands were only removed if it was judged that the life of the patient was not too much jeopardized by the additional time required for their removal.

As to the percentage of operability of cancer cases, it had to do directly with both primary and end results, hence was germane to this discussion. Jacobson had shown conclusively by his statistics that the percentage of operability of cancer of the uterus by the radical abdominal operation was more than twice as high abroad as it was in this country. This meant a number of things. It signified that we had not educated the profession or patients as to the necessity of early examinations for the detection of the disease. It also meant that the American surgeon must operate upon a larger proportion of advanced cases; at least he would not have as many early cases as foreign operators. Primary and end results would be correspondingly worse the more advanced the cases subjected to operation. During the ten years he had been employing the radical abdominal operation he had examined, in his university and private clinics, 218 cases of carcinoma of the uterus. Of these, fifty-one or 23.4 per cent. were judged to be suitable for the radical operation. Greater experience led him to the conclusion that some of the early cases were too far advanced for this operation. On the other hand, he thought he missed some cases which could have been so operated by not making the decision rest upon an exploratory laparotomy rather than upon bimanual examination.

In conclusion, he was neither elated nor discouraged over the results set forth above. He had saved patients who, operated upon by older methods, he was quite certain would now be dead. That he should save the next patient he operated upon he was not so certain, for above every other operation he had had to do with, its primary and end results were the most doubtful.

#### THE RADICAL ABDOMINAL OPERATION FOR CARCINOMA OF THE CERVIX, WITH A REPORT OF TWENTY-EIGHT CASES.

DR. HOWARD C. TAYLOR, New York City, said that theoretically there was a point at which a cancer was a local process and could be cured surgically. Practically few cases were seen sufficiently early to get this cure.

While in some organs it was difficult to diagnose a case of cancer sufficiently early to get a cure, the examination for a possible carcinoma of the uterus was one which was easily made in a few moments without special pain or discomfort to the patient, and was positive in its findings, and it should be the work of this Society to devise some plan by which we got these cases early, and until we did that our statistics would not compare with those from abroad.



During the years 1910-1911, his percentage of operability was 70 and 68 per cent. These percentages, however, did not really carry a great deal of information, as obviously a certain number of inoperable cases were never seen by the specialist.

It was important that all doubtful cases should be examined under an anesthetic, and, if necessary, an exploratory laparotomy be done. If nothing further was accomplished by the examination under an anesthetic, the growth could be cauterized, and disagreeable symptoms relieved for a time.

During the years 1910-1911, that is, since he began to do the radical operation as the routine on most of his cases, he operated on 40 per cent. more cases than during any two previous consecutive years, and this indicated the increased possibility of the radical operation in his hands. That is to say, more cases that were further advanced were operated upon by the radical abdominal operation than would have been by a simple hysterectomy.

In regard to the first symptoms of the disease, among the cases on which he did an ordinary abdominal hysterectomy or a vaginal hysterectomy, in 50 per cent. of the cases the symptoms lasted less than three, in 40 per cent. of the cases between three and six months, and only in 10 per cent. have the symptoms lasted for more than six months.

In comparison with these figures, on the cases on which he did a radical abdominal operation, the first symptoms had existed for less than three months in 18 per cent. of the cases, between three and six months in 42 per cent. of the cases, and over six months in 40 per cent. of the cases; that is, the percentage of cases operated upon, the duration of whose symptoms had existed for six months, had been quadrupled by the radical abdominal operation over those of all other hysterectomies.

Ahlhorn, from a clinic in Leipsic, gave for corresponding periods, 54 per cent., 28 per cent., and 18 per cent., respectively. The comparison of the author's percentages with those of Ahlhorn would indicate that the cases in this country that were operated upon had lasted for a much longer time than those in Germany.

In an analysis of eighty-three detected cases of carcinoma of the uterus from the Board of Health of New York, it was found that 75 per cent. had never had any operation whatsoever, other than a possible cauterization, and 25 per cent. had had a hysterectomy. The number of cases on which a hysterectomy was done would be further decreased if we excluded cases that were operated upon to relieve symptoms, and cases of carcinoma of the fundus.

It would seem from a consideration of these percentages, that it would be possible to do important work for the community by getting these cases earlier.

*Primary Mortality.*—The author's primary mortality in the twenty-eight cases was 10.7 per cent. Of the three deaths, one died eighteen hours after the operation from shock, the second



from peritonitis, and the third from some cardiac condition. Of the three cases operated upon previous to five years ago, one case was known to be dead, the others were not located. Of the twelve cases operated upon previous to two years ago, including the three just mentioned, six were known to have died, one from the operation, five from recurrences, and six cases could not be found. Of the eight cases operated upon between one and two years ago, five cases had died, one from the operation, and four from recurrences, three cases remaining well to-day. Of the eight cases operated on during the past year, two cases had died, one from the operation and one from recurrence, four remaining well, and two cases not having been located.

In summarizing the author drew the following conclusions:

1. The primary mortality of the radical abdominal operation is not such that it should deter us from doing the operation.

2. The percentage of operability of the cases that come under the observation of an operator would be greatly increased by means of this operation over the simple hysterectomy as formerly done.

3. The end results would never compare favorably with the end results reported from abroad until we were able to get our cases at an earlier stage of the disease, and that our justification for doing a radical operation was its moderate mortality and the relief of symptoms in a disease otherwise hopeless.

4. That our most promising field of endeavor on the subject of carcinoma of the uterus should be: (1) More reliable and complete statistics on operability, the community operability, primary mortality, and end results. (2) A well regulated, organized plan of campaign in order to get our cases earlier than we do at the present time. This by furthering the education of the medical profession and the public at large and by the routine examination of all women after a certain age.

#### THE PROGNOSIS IN RADICAL ABDOMINAL OPERATION FOR UTERINE CANCER.

DR. FRED J. TAUSSIG, St. Louis, said the question of prognosis in cancer of the cervix could be considered under three heads:

1. The prognosis before operation or percentage of operability.
2. The prognosis of the operation itself or operative mortality.
3. The final prognosis after operation or percentage of recurrence.

The prognosis before operation resolved itself into the question, What patients were in the absence of other curative methods hopelessly doomed, and what ones had still a chance to be helped by operative removal of the growth? It was surprising how meager were the statistics as to the operability of cervical cancer in American literature. Sampson's figures of 39 per cent. operability in 412 patients admitted to Johns Hopkins Hospital was probably higher than the actual number, for it was uniformly true that many hopeless cases came only to the dis-

pensary and never entered the hospital for even palliative measures. The author's personal tabulation based on the experience of the past seven years showed twenty-three cases subjected to radical operation out of 115 cases examined in dispensary and hospital work. Only one operable case refused operation, making a percentage of operability of a little over 20 per cent. That he had been unduly conservative in setting the operative indications, no one would possibly claim, for he had certainly erred in the opposite direction.

The prognosis of the operation itself depended largely upon the general condition of the patient, the amount of the involvement, and not to an inconsiderable extent upon the experience and skill of the operator. Women with fatty abdominal walls were particularly bad risks for an operation such as this, requiring a prolonged Trendelenburg position. Where cachexia was an early symptom, the operative shock was very great and the mortality high.

For purposes of analysis the operable cases could best be grouped under four heads: 1. Cases in which the positive diagnosis of cancer could only be made by the microscope. 2. Cases with a well-defined ulcer involving a greater or less part of the cervix but without parametral involvement. 3. Cases with cervix involved and extension into the parametrium or the upper portion of the vagina, but still partly movable. 4. Cases with involvement of parametrium almost to the pelvic wall or beginning bladder infiltration, but still not hopelessly inoperable.

The author presented a total of sixty cases. Of his own twenty-three, twelve belonged to the first three groups and only one died of the operation, a mortality of 8 per cent.; whereas of the far advanced cases only three out of eleven survived, a mortality of 72 per cent. This clearly showed that it was not the operation itself that was so dangerous, but the unwise extension of operative indications.

The cause of the eighteen operative deaths could only in four instances be attributed to shock. In the remainder the patients recovered from the immediate effects of the operation, but usually developed some form of septic infection. In eleven of them death was ascribed to this cause and occurred from the third to the fourteenth day. One patient each died from cerebral embolism, nephritis, and myocarditis.

Deducting these eighteen deaths from the total of sixty operations we had left forty-two patients to be studied as to the number and time of recurrences. In two instances the recurrence was noticed as early as the second month, and was probably due to an incomplete operative removal of the primary growth. Of the total number of fifteen recurrences, twelve became manifest within twelve months after operation, one developed during the second year, one during the third year, and one patient in his own series did not develop a recurrence until four and a half years after the primary operation. There

were nineteen free of recurrence out of forty-two who survived the operations. Six of the nineteen were operated on within the last three years and hence were too recent to be of special value in these calculations. This gave three free of recurrence after three years. The total number of operations in this series that were done over five years ago was fourteen.

Considering operations done more than four years ago there was a total of twenty-five with a mortality of six or 24 per cent., and eight free of recurrence. Three were either not traced or died of intercurrent disease. Taking an approximate of 25 per cent. operability as true of the whole series, there was 9.5 per cent. absolute cures.

If we were justified in drawing any conclusions from the foregoing reports, they would be as follows: The radical abdominal operation for cervical cancer was not in itself a dangerous operation. It became dangerous only in advanced cases, owing to the attendant complications, septic infiltration, injury to the bladder or ureter, bleeding, prolonged narcosis.

The percentage of recurrences was distinctly less after this operation than after simple vaginal hysterectomy. It should, he believed, be employed in every case of cervical cancer in which there was no special contraindication to a more extensive operative procedure.

In far advanced cases the immediate operative risk was so great and the likelihood of recurrence such that these patients had better be classed as inoperable. Out of fifteen patients in this group not a single one was alive to-day.

The fact that our percentage of absolute cures was small as compared with German or Austrian statistics was not due to greater operative mortality or to narrowing the limits of operability. It was not due to lack of boldness or skill on the part of the surgeon, but to the character of the material that came to him for operation. The women were negligent of early symptoms and the average practitioner careless of diagnosis or inclined to try palliative measures until the disease was too far advanced. It was a sad reflection on the intelligence of American women and the American practitioners of medicine that in spite of the fact that many really inoperable cases were attempted, the percentage of operability was less than one-half of that of the average German clinic. Only by improving the training of the average practitioner, by the extermination of quacks and most of all by the persistent systematic education of the laity could we ever hope for better results.

#### REMOTE RESULTS IN ABDOMINAL HYSTERECTOMIES FOR CANCER OF THE UTERUS.

DR. THOMAS S. CULLEN, Baltimore, said he sent out more than eighty-five letters to gynecologists and surgeons of the South to learn their results, immediate and remote, after abdominal hysterectomies for cancer of the cervix. A large number



of replies were received, but very few of the operators had had much experience along this line. One noticeable feature of the replies was the almost uniform lack of the after history of the patient. The individual was either lost sight of or the surgeon in the midst of his many duties did not take time to locate his old cancer cases in order that he might find out in just what percentage of the cases he had been able to effect a cure. Several of the operators, however, reported very good results, among others being John E. Cannady, Charleston-Kanawak, West Virginia; Lucius E. Burch, Nashville; J. Garland Sherrill, Louisville, Kentucky; and J. M. Hundley, Baltimore.

Dr. Cullen had performed in all over fifty Wertheim operations. The more recent ones he did not refer to in his tabulation.

He reported the results in forty-eight cases. Immediate death, eleven cases; remote death at periods varying from a few months to five years, twenty cases; patients lost track of, five cases; patients living and well at periods varying from one to thirteen years, twelve cases.

Twenty-five of Dr. Cullen's cases had been operated upon over five years with the following results: The mortality in the first twenty-five cases was seven, 28 per cent.; in the succeeding twenty-three cases, four, 18 per cent.

With the early detection of cancer the mortality would naturally be lower.

Immediate death, seven cases; not located, 1 case; remote death at periods varying from a few months to five years, eleven cases; living and well, six cases or 24 per cent.

Length of time since operation on patients that have passed the five-year limit and were perfectly well: H., December, 1905, equals six and one-half years; H., April, 1904, equals eight years; Y., January, 1904, equals eight and one-half years; D., August, 1903, equals eight and three-fourth years; W., August, 1902, equals nine and three-fourth years; K., June, 1899, equals thirteen years.

Thus in 24 per cent. of Dr. Cullen's cases operated upon over five years the patients were living and well.

He suggested that each year one member of the society should be designated the repository for the results of the abdominal hysterectomies for cancer for the succeeding year, and that this material be analyzed and published in the proceedings. He also urged that the aid of the Ladies Home Journal and Collier's Weekly or some other widely read papers be enlisted in order that the American women might in a very short time be clearly impressed with the great advantage of an early diagnosis in cancer of the uterus.

#### DISCUSSION.

DR. JOHN A. SAMPSON, Albany, stated that since leaving Baltimore in the spring of 1905, he had operated upon twenty-five patients for cancer of the cervix by the radical abdominal



operation. Some of the pelvic lymph nodes were removed at twelve operations, and these were examined microscopically in all but one instance, unfortunately a node from one case, which although the growth apparently contained cancer, was lost. Metastases were found in one or more nodes in seven of the twelve cases (eight if the one lost was counted as positive). It was, therefore, known that at least seven of the twenty-five cases had metastases in the pelvic lymph nodes at the time of operation.

Five died as the result of the operation, and four of these were advanced cases; in one the trigonum of the bladder and lower ends of both ureters were resected, in another a portion of the right external iliac vein was excised for the extension of cancer about it from a metastasis in a lymph node, in another several large cancerous lymph nodes including a large lumbar node were removed, in another a portion of the bladder was excised. The fifth was less extensive than the above, but the patient was in a feeble condition. One of the five patients died in a few hours after the operation, and the other four died from four to seven days afterward. The cause of death in all four was apparently asthenia, *i.e.*, they never completely rallied from the shock of the operation. In his experience the operation in the favorable cases was attended with a very low primary mortality. The appalling high primary mortality had occurred in "over the borderline cases." This would apparently emphasize the importance of not operating on the latter cases were it not for the fact that some of them did survive the operation and might be cured.

Only one instance of ureteral fistula occurred from interference with the blood-supply of the ureter in the twenty patients surviving the operation, and this closed spontaneously.

As to the end results (five-year limit) eight of the twenty-five patients were operated upon over five years ago. Two of these died as the result of the operation, and two died later from recurrence. Four were clinically free from cancer at the present time; that is, four of eight cases operated upon and of six surviving the operation.

He briefly referred to the six cases surviving the operation.

The cases were too few in number from which to draw any definite conclusions, but they showed that apparently unfavorable cases might be cured, and that it was not safe to give a favorable prognosis in an apparently early case. With further experience, we would learn on what to base the prognosis, such as the origin of the growth, whether from the portio vaginalis or within the cervical canal, its type inverting or everting, its histological structure; the age of the patient, whether multipara or nullipara, etc.

He had had the opportunity to obtain autopsies on five patients dying from recurrence, including the two just reported. In three the immediate cause of death arose from the compression of the ureters by cancer extending from metastases in accessible

iliac lymph nodes. In the fourth there was an extensive local recurrence in the field of operation from cancer not removed at operation. In the fifth there was an extensive local recurrence filling the pelvis and metastases to the lungs, heart, one kidney and skin.

He believed that metastases occurred in from one-third to one-half the operable cases, and that while glands which were not readily accessible might be involved as well as accessible ones, that the accessible ones were first and most frequently involved, and he referred especially to the iliac lymph nodes near the origin of the internal iliac vessels. He, therefore, believed that these nodes should be removed when the condition of the patient would permit, and especially in the apparently early cases where the operative technic was easy, and the patient in good condition.

DR. J. WESLEY BOVEE, Washington, D. C., presented his statistics in radical operations for cancer of the cervix uteri. On March 31, 1898, he began the employment of radical surgical treatment of cancer of the uterus under the stimulation of Werder's paper that had appeared the month before in the *AMERICAN JOURNAL OF OBSTETRICS* (vol. xxvii, pages 289 and 293).

The operation he then began using was a combination of Werder's and the one proposed by Ries, and was described with a report of his first fifteen cases in the *American Gynecological and Obstetrical Journal*, 1901. This plan was modified February 22, 1902, by ligating the trunk or the anterior branch of the internal iliac arteries. Occasionally he had modified it by severing the vagina from above through a ribbon compressed and cooked by the Downes electrothermic angiotribe.

His statistics of the employment of broad radical excision for cancer of the cervix down to three years ago were as follows: Number of cases operated on, thirty-six. Mortality of operation was as follows: shock, five; peritonitis, two; fecal fistula-asthenia, fourteenth day, one; renal insufficiency, one. Total, nine cases.

Died from recurrence of cancer at the end of one year, one; at the end of eighteen months, one; at the end of twenty-one months, one; at the end of two years, two; at the end of three years, one. Total, six.

Died from other diseases,—of uremia after ureterocystotomy at time of operation (lived eleven years), one; unknown intercurrent disease (lived two years), one; of tuberculosis (lived six months), one. Total, three.

Number living for more than three years without recurrence, eight; total after recovery from operation and not traceable, ten.

From this table it would appear that twenty-seven patients (75 per cent.) recovered from operation, and that of these eight, or practically 30 per cent. had remained well for more than three years. The exact amount of time they had lived, apparently well, after operation, was for one, fourteen years and two months;

one, twelve years and three months; two, twelve years; one, nine years and eight months; one, nine years and one month; one, seven years and four months; and one, four years and nine months.

His second case operated on April 4, 1898, was unique. A cancerous mass was found surrounding (in the broad ligament) and dilating the left ureter. The mass and its contained portion of the ureter were removed and the ureter implanted into the bladder.

The late Dr. James Carroll, U. S. A., examined the specimen microscopically and reported that while the duct was not involved in the malignant process, the surrounding mass was cancerous. This case was reported in his article of 1901. The patient was readmitted to the hospital in September, 1909. As Dr. Bovee was absent from home, his associate, Dr. G. Brown Miller, treated her. She died a few hours after admission, and no autopsy was made. Dr. Miller believed her fatal illness was uremia, and the speaker wondered if a defect in the unnatural ureterovesical junction had not been an etiological factor, or if cancer had not recurred in the kidney or kidneys. But assuming the three patients died from intercurrent disease, and the ten that were not traceable, all died of recurrences, we had left eight patients that had lived a total of eighty-one years and three months, an average of ten years and two months since operation, without recurrence.

The practical question he desired answered was whether such radical surgical procedures, as we were now considering, for the treatment of cancer of the cervix uteri, were advisable. While his experience was small, he was greatly influenced by it, and believed the saving of 22 per cent. of cases for an average of more than ten years was a strong supportive argument. No doubt each member had several cases of nonrecurrence for years following vaginal hysterectomy for cancer of the cervix. He frequently saw two ladies that were in splendid health, whose carcinomatous uteri he thus removed more than seven years ago. But he would reserve that operation for only those patients whose conditions prohibited the employment of the broad dissection by the abdominal route. He believed that improvements in results might be secured not alone by an educational propaganda calculated to bring women suffering from this disease to operation early, but by changing the technic in two ways, to wit: To lessen the primary mortality, and to lessen contamination during the operation. For the latter he would recommend the use of the cautery in some form. In his work he had, since 1903, employed for this purpose Downes' electrothermic angiotribe which he had found to be a very serviceable instrument. Ligation of the trunks of both internal iliac arteries or of their anterior branches, if large, greatly assisted in controlling hemorrhage, an important matter. He was less an advocate of removing the pelvic glands than formerly, as he thought it



markedly increased the primary mortality rate from shock. The time of the operation should come within the hour, and he could do so if not much time was used in dissecting out glands.

DR. JOSEPH BRETTAUER, New York City, stated that he did his first Wertheim operation in September, 1902, and this patient lived until 1905. Every one of the nineteen other cases had not passed that limit. Three were alive not more than two and a half years. The rest all died between two and three years after operation. They were all more or less advanced cases. The ureter was resected once; the bladder was resected partially once, but so far as he could learn from reading their histories over, there were no special surgical difficulties. He mentioned one case which was still alive and apparently very well. He saw her only a week ago. She was a young woman, who was operated by one of his assistants during the summer, and on his return within a few months he reexamined this patient and found a recurrence in the vaginal fornix in the scar. He readmitted her and removed the recurrent disease which was about the size of a walnut. He removed it easily by excising the free adherent part of the bladder and united the bladder edges again. This was four months after the primary operation and the patient was now perfectly well. This was the greatest satisfaction which he got from his abdominal work for cancer. Two patients died of primary sepsis; one patient died of secondary hemorrhage.

He expressed his surprise at the small number of cases of cervical carcinoma that came under the observation of all members of the Society. In ten years in a material comprising over 15,000 gynecological cases exclusively, he had seen twenty inoperable cases of carcinoma of the cervix, and nineteen operable ones, which was a very small percentage of carcinoma. He did not see many cases of carcinoma of the cervix. He saw one occasionally, and apparently this was very rare in the experience of others. He well remembered the time when in the out-patient department of the clinic there was not a day, at least one or two days, that passed without seeing a case of carcinoma of the cervix.

He operated on a woman last year who had a beginning carcinoma of the cervix which was superficial, and yet after a most radical operation (it was a private case) she had a very large recurrence high up in the pelvis, which was found inoperable.

DR. LEROY BROUN, New York City, said that the lesson we were to learn from these papers and the discussions was that gynecologists were not getting their cancer cases early enough. The percentage of operability was not as high as in foreign clinics. The percentage of immunity after five years was likewise not as high as in foreign clinics, and the key to the situation was that operators did not get these patients early enough, and it was necessary to educate the laity in the various communities.

He was rather impressed with the condition with reference to the clinic here (Baltimore) in which the percentage of operability



was sixty-one. There was nothing of that kind in New York; there was nothing of that kind in Ann Arbor or any other locality that he knew of in this country. The reason evidently must be one of education.

In looking up this subject some time ago he was impressed with the fact that of all the uterine cancer cases applying to von Franque's clinic, 33.8 per cent. were operable; in Zweifel's clinic, 65.7 per cent. were operable; in Hofmeier's clinic, 52.2 per cent. were operable; in Bumm's clinic (Halle), 80 per cent. were operable; in Bumm's (Berlin) clinic, 65 per cent. were operable; in Sellheim's clinic 72 per cent. were operable; in Henkel's clinic, 75 per cent. were operable; in Schauta's clinic, 59.5 per cent. were operable, and in Wertheim's clinic, 50 per cent. were operable, making an average of 50 per cent.

Polosson had a record of 211 radical operations for uterine cancer even at that time. He gave only percentages by series, as follows:

	Operability.	Mortality.	Radical cure.
1 series	56 per cent.	18 per cent.	35 per cent.
2 series	86.8 per cent.	13.7 per cent.	61 per cent.
3 series	77.2 per cent.	11.3 per cent.	69 per cent.
4 series	75 per cent.	20.6 per cent.	Too recent.

No clinic in America could show such a high percentage of operable cases.

Peterson stated that his own was 31.7 per cent. What a difference between the operability that we have in this country as compared with that abroad. There was only one explanation, and that was education of the lay people and impressing upon general physicians the importance that their cases should be sent early for operation. He believed that if each one of the members when he left the meeting for home made it a point to attempt to focus attention upon this one thing in their respective communities, more of these cases would be sent for operation early than had been done in the past. Personally, he had six cases to report, with one death. This patient died after a prolonged operation of some two hours and a half, and those who were alive were not to be included in the five-year limit.

DR. JOHN O. POLAK, Brooklyn, New York, said he had been following the radical operation for about ten years, and he was frank to say, that as far as any statistics he could get of his patients, were concerned, he had not a single patient living on whom the radical operation was done. This might be due to a defect in his procedure, or it might be due to a bad selection of cases, but his results had been that of all the radical hysterectomies he had done there was not a single one of his patients alive that he could trace. Against this, he had four patients alive who were operated on by the Byrne method, one having been operated nearly nineteen years ago, and one (the shortest period) having been operated on eight years ago. These were

all cases that he considered practically inoperable by any radical procedure and that was the reason he adopted the method of Dr. Byrne. He followed out a technic which was different from what was understood by the profession at the present time, namely, that the cautery dome was placed in position and the tissues simply cooked, not for minutes, but for practically hours, leaving simply a shell.

With reference to the matter of not getting these cases early enough for operation, it was an odd thing that in his own clinic at the Long Island College Hospital, where there were 4000 new cases a year, in the last year there had not been a single operable case that had presented itself, operable in the sense he considered operable, such as two or three cases Dr. Cullen had mentioned this morning that had lived a number of years.

DR. SETH C. GORDON, Portland, said he remarked to Dr. Sampson while the discussion was going on that he had watched carefully through twenty-five years connection with the Society that at each meeting, at which there was more or less cancer talk, he believed, taking the very best reports that had been made, they had not shown as good results as Dr. Byrne showed during his life time. As Dr. Polak had said, it was really cooking the disease. If one got the disease early he could cook it very much more than if he got it late. In other words, he stopped absolutely the infection from spreading any farther. In the very worst cases one did absolutely the best that could be done in his opinion under any circumstances. The extremely advanced cases, no matter what was done for them, would die. If they did not die primarily, they died very soon afterward. The only hope lay in education of the laity and early removal of the disease. There was no question in his mind that one could cure cancer of the uterus the same as he could cure cancer of the lip, but it must be seen and operated on early. He thought it was true that 75 per cent. of the operations done for cancer of the lip were followed by no return, so that the whole matter lay in education of the people to the extent of getting the disease early and making complete removal. But if one waited until the disease was thoroughly established, there was nothing as yet that approached the record of Byrne.

DR. I. S. STONE, Washington, D. C., stated that his modesty prevented him from answering the circular letter of Dr. Cullen. He thought it was hardly worth while for one in a small clinic to report two or perhaps four cases that had not exceeded the five-year limit, and he decided it was not worth while to answer the letter unless he could point to cases of five years or more that had lived without recurrence of the disease. He knew that his patients lived many years longer after a radical operation than they otherwise would, and consequently he was encouraged to do radical operations. At the same time, he was not unmindful of the fact that the cautery method in the delayed cases was far more desirable than any other method and yielded better results.

DR. WILLIAM P. GRAVES, Boston, had done the Wertheim operation for cancer of the cervix in eighteen cases, and this covered a period of a little over three years. He had followed Wertheim's method quite closely. Fortunately he had, at that time, as his assistant Dr. Hutchins, who had been Dr. Kelley's resident physician in Baltimore, and who, after leaving Baltimore, went to Vienna and saw Wertheim operate, and who later assisted Wertheim in Dr. Kelly's clinic, so that Dr. Hutchins knew the technic of Dr. Wertheim in detail. The only difference between the speaker's method and that of Wertheim was the matter of preliminary curetage. Wertheim curetted at the time of the operation without ether, but the speaker had found it more desirable in his cases to curet first under ether, then use a weak formalin solution, and before operation apply tincture of iodine. He had been able to follow all of his eighteen cases. Of the living patients, he had seen all within four months. Among eighteen cases he had had a primary mortality of two, or 11 per cent. One death was due to the fact that he had operated on an inoperable case. He could not remove all of the cancerous tissue, and the patient died from delayed shock in about twenty-four to thirty-six hours. The other death was due to carelessness. Ten patients were living without recurrence, and eight were dead. Two died immediately after operation, and six had died from recurrence.

DR. HUGO EHRENFEST, St. Louis, called attention to what he considered a fallacy in comparing the results of operations as they were found in the reports of German clinics with the results obtained in America. Early diagnosis was the crucial point, and education of the public was the one factor which led to early diagnosis. Illiteracy was more prevalent in European countries than in America, and to feel that early diagnosis was entirely dependent upon the education of the public was wrong. It was not so much the education of the public as it was the well-advertised name of a clinic. This was the difference in his opinion. The practice of a man like Wertheim had much more to do with the early diagnosis of cancer and with the early consultation of women who had any sort of female trouble than the education of the public at large. If the Johns Hopkins Hospital had such a high percentage of operability, he did not know how much the work of Kelly and Cullen had to do with the factor of the high operability, but possibly a great deal, and it was not so much due to the fact that the population in Baltimore had been educated in regard to the early symptoms of cancer. Women here did not go to the clinics for all the ills they had. They went to the general surgeon and he was probably not as much interested in the early symptoms of cancer as was the gynecologist.

DR. E. E. MONTGOMERY, Philadelphia, stated that his experience in the treatment of cancer was that we had very much yet to learn from the pathologist and as to the best methods of its treatment. He had seen cases in whom the condition was such



that he had little hope of their recovery, and yet had operated on them, doing either the vaginal or abdominal operation as the conditions of the patients seemed to make most desirable, and had found that these patients lived for a number of years; some of them still living after more than ten years without any recurrence of the disease. He had seen other cases in which the disease occupied either the body of the uterus or the vaginal portion of the cervix, in which it was slight indeed, and in which his experience would lead him to say that here was a case in which we might hope for a radical cure, and yet within a few months afterward there would be recurrence of the disease and death of the patient. There was no question as to the advisability of doing as radical an operation as possible, of operating in healthy tissue, going beyond those points in which the disease first manifested its tendency to recurrence. In carcinoma of the cervix, as in carcinoma of the mammary gland, it was not an unusual thing to find a blocking of the lymphatics which led to regurgitation of the lymphatic fluid and carrying back of the disease, so that we might have consequently involvement and recurrence in the vagina at some point rather remote from the point at which the disease was originally found. For this reason it seemed to him that as much of the vagina should be removed as possible. He did not believe there was much advantage in the dissection of the lymphatic glands of the pelvis in carcinoma. The investigations of Schauta and others had demonstrated that the lymphatic glands, remote from the uterus, those which were not readily removable, were quite as frequently involved as those which were close to the organs, and where we found there was lymphatic involvement, it was likely that the disease would recur very shortly, and it made no difference how radical the operation. Again, it had been demonstrated by what had been said, and by the experience of many men that an apparent involvement of the lymphatic glands was not always necessarily an indication of its being carcinoma; that in the secondary conditions which were associated with the carcinoma the glands might be infected from other conditions entirely rather than from the carcinoma itself. He had seen cases in which there had been evident involvement of the glands of the abdomen, and yet these patients had gone for years subsequently without recurrence. He remembered very well a patient on whom he operated in 1900, and the physician with whom he saw this patient was rather inclined to resent the fact that he had advised hysterectomy. She was a single woman. She had an extensive carcinoma of the cervix, and he operated upon her. She lived some three years afterward, when there was recurrence of the disease in the abdominal scar, without any involvement of the vagina or other portions of the pelvic structures. This recurrence in the abdomen was operated upon by the excision of a considerable portion of the abdominal wall, and it was found that the mass of disease here was adherent also to a coil of



intestine beneath; that the mesenteric glands in the immediate vicinity were involved. A portion of the involved intestine was excised, an anastomosis made, the abdominal wound closed, and the woman lived three years before recurrence took place, and then it occurred in the vagina.

DR. CHARLES M. GREEN, Boston, spoke of one case which afforded a lesson. This particular patient came to his office sixteen years ago, the day before he was going away for his summer vacation. She had no idea that she had cancer. She was a widow who had one child and said she had contemplated a second marriage and would like to be examined to see if she was well before she married again. He inquired as to any possible disturbance of health, and the statement was made that for the last two preceding menstrual periods she had a flow which was a little more than usual in amount, but other than that she was perfectly well. On examination he found what seemed to be pretty well advanced carcinoma. As he was going away he referred the case to a colleague who removed the uterus by vaginal hysterectomy. He was told by his colleague later that he did not know whether there would be a recurrence or not. He was skeptical about it. The patient was not seen again until this spring. She had lived sixteen years, but she then had general abdominal carcinomatosis. He was reminded of this case by what Dr. Montgomery had said. The operation was a success for sixteen years, with no evidence of any recurrence about the pelvis.

What could be done in the way of educating women? In a recent popular lecture to women he advised every woman who had ever borne children, to present herself for examination every six months, as we were told we should go to a dentist periodically for examination of our teeth. It was known that carcinoma would get under headway in six months, and if every woman who had ever borne children would present herself as often as once in six months for vaginal inspection, we might get a good many of these cases early enough to do something.

DR. SIDNEY A. CHALFANT, Pittsburg (by invitation), said that it was not the custom of Dr. Simpson to do the radical Wertheim operation. Of the cases embracing the five-year limit, they had had thirty cases admitted. Of these only nine were suitable for the radical operation. Of these nine, three died as a result of the operation; one died later of pneumonia at the end of one year; one died five years after operation of recurrence; and one died five and a half years after operation. Of the nine cases, there were three living and well at the end of three years.

In regard to the Byrne operation, out of thirty cases, four were considered inoperable, so far as radical operation was concerned. These four had high amputation of the cervix with the cautery. Of these four, one was living, and well at the end of seven years; another one was living and well at the end of six years. This case was rather interesting. The woman came

in at the end of four years during Dr. Simpson's absence from the city, complaining of an inguinal hernia. Operation was done for the hernia and this gave an opportunity for examining the pelvis, and no evidence of cancer was found at the time. She is still living and well.

The technic of the operation, as performed by Dr. Simpson, was similar to that Dr. Werder recently described, except he did not use the Downes' clamps on the uterine artery. The cervix was cureted and cauterized and closed and circumcized with the cautery, and the operation completed from above. In certain cases where the patients did not seem to be good risks for the combined operation, the vaginal operation had been done, but the exact percentage of success of those operations he could not give at the present time.

DR. GEORGE H. NOBLE, Atlanta, submitted the results of his work in this field. He had intended to send this to Dr. Cullen, but he did not get in his report early enough. For that reason Dr. Cullen did not have it in his paper.

Of late he had not been doing as much work in carcinoma of the cervix as he did some years ago, because he would either hear from the patients that they had a recurrence, or that death had occurred. He did quite a radical operation always, but performed it under protest. In looking up his statistics he was much surprised to find that they were much better than he had any idea of. Of the cases operated upon over five years ago for carcinoma of the cervix there were thirty-eight. Of this number, there were thirteen living. He was unable to trace six of the cases, and it was a fair statement to make, that if one could not trace these cases they were apt to be in another world. He would say, however, they were private patients. He made no effort to trace patients who came to the college clinic or to the city hospital, because in Atlanta they had a floating population, and there were so many negroes who changed their names every time they moved, so that one could not tell where they were and what became of them.

As to the technic of the operation, it was very much like the Wertheim. Years ago he used to scrape off all necrotic tissue and then cauterize, but it required so much time to do this that he simply adopted the use of the cautery with some such apparatus as the Downes, going into the abdomen, and making a thorough eradication. As a matter of interest, in two of the cases he resected the external iliac artery. In two or three cases he resected the ureters, but this was a thing that did not do much good. In six cases he resected the bladder. He thought a great many cases of recurrence of the disease were due to the fact that the operator did not clean out the lymphatics and the vessels in the lower border of the broad ligaments by the side of the vagina and did not remove enough of the vagina and bladder. The recurrence in most of these cases was in the scar at the edge of the vagina, and not the bladder. He found in the cases in

which he cleared the side of the pelvis below the level of the ureters thoroughly, removing a considerable portion of the vagina and resecting the bladder, the results were better. He might add, out of this number of cases there was one death direct from the operation. He had had other deaths in patients who had not gone over the five-year limit. In this particular series or set of cases one death was directly due to shock from the operation, the patient dying within forty-eight hours.

DR. JOHN G. CLARK, Philadelphia, in closing the discussion, stated that the statistics that had been brought out pointed in his mind to the fact that we might use, at the present time, more discretion in the type of operation that was done. In the first place, that in perhaps the earlier cases that had been reported, where no mortality occurred, we might do the very radical type of operation, but in the more advanced cases we should resort to the cautery method, and so forth. In other words, his notion to-day was, after listening to the discussion, and his review of the literature, that he could be a little more liberal in his choice of what operation he would do, because when one took van Knott's simple vaginal hysterectomy cases with 15 per cent. recoveries as compared with Wertheim's absolute cures of 19 per cent., there was not such a wide difference as one expected. Therefore, he should not be as radical as he had been in former years.

DR. REUBEN PETERSON, Ann Arbor, in closing, said, What was the use of van Knott getting 15 per cent. recoveries if he could get no per cent.? This did not help him any. He did not save any patients by vaginal hysterectomy for cancer. The only reason he kept on performing the operation was because he had saved some women which by other methods he lost. He had not saved any of them, and he was talking now about carcinoma of the cervix.

He had learned a lot from this discussion. He was encouraged by it. It was much more favorable with regard to the end results than he had hoped. He was encouraged with regard to the primary mortality in the hands of other men. He was encouraged also to pursue radical operations on cases that he thought were hopeless. Dr. Taussig had brought out that fact and also Dr. Sampson. In cases where the cervix was necrotic, and there was hardly a shell left, and one picked out the disease with forceps and thought the patient had no chance, but on account of a different type of carcinoma that patient would live, and the other case that one thought was a good case for operation would die, so this led him to go on with this operation.

He was very much interested in what had been said with reference to the Byrne operation for cases that were inoperable. He intended to try it, because other methods had not been satisfactory in his hands for the inoperable cases.

DR. HOWARD C. TAYLOR, New York, in closing said he had gotten a good deal of help along certain lines as he had felt



somewhat discouraged with regard to the end results of the operation. There was no question at all that the results had been discouraging, as was pointed out by Dr. Peterson. It did not make any difference what operation was done, if the surgeon did not get the cases early, he could not cure them. Some means must be devised whereby these cases could be operated on early, and women generally should be educated with regard to carcinoma of the cervix. Dr. Greene had used the same argument he had often used, namely, he considered it necessary to go to a dentist once in six months, and this was merely to avoid the formation of a cavity or losing a tooth. Think of what this meant to a woman. It was a question of life, and not one of losing an organ. It was often more important for her to go and find out and to know that everything was all right; it could be determined easily, and if women knew how much this meant to them they would be willing to submit themselves periodically for inspection.

DR. FRED J. TAUSSIG, St. Louis, in closing said there were only two points he wished to bring out, and one was the manner in which these statistics were collected with regard to Western surgeons. Perhaps that term was a misnomer in so far as all but five out of the sixty operations included in this tabulation were done by St. Louis gynecologists. Most of these men were well known to the members, they had done the typical operation, he had witnessed their work, and knew that the cases included in this list were actual radical abdominal operations.

The subject received a great deal of discussion in the early part of 1902-1903 at several of their meetings, so that there was no question as regards the character of the operation that had been done by these men.

In the second place, he wanted to speak of the educational work they were doing in St. Louis. They were in a particularly fortunate position in having at St. Louis a hospital which was devoted primarily to the treatment of cancer cases, and it was also a free hospital. Dr. Gellhorn and he had been particularly interested in this educational problem, and they had had the permission of the board of directors to institute a systematic education of the public and of the medical profession of Missouri. They were confining their efforts to Missouri, and they hoped in five years from now to give results as the result of the educational movement. The manner in which this was done was threefold. In the first place the various county societies were interested in this subject, and members of the staff went to the county societies and delivered talks not usually upon the subject merely of cancer of the uterus, because this was only one of the many forms of cancer concerning which education was necessary, but upon the subject of cancer in general. A second form of education they had employed was that of educating nurses. He had given two talks in St. Louis, before the Graduate Nurses Association and Visiting Nurses Association, impressing upon



them the early symptoms, particularly of those forms of cancer which appeared in women, breast and uterine cancer, and in uterine cancer concerning which he had printed a small leaflet that could be safely distributed by them among such women as they might have occasion to visit for other purposes. The visiting nurses particularly were distributing among women of the city literature concerning tuberculosis, and at the same time, such leaflets concerning cancer could be distributed with propriety. In the third place, they had been bold enough in St. Louis to have lectures given by members of the medical profession before the laity. He felt they had been very remiss in their duty. They had been afraid of what their confreres would think of them, and perhaps they had been unusually fortunately placed because of having a free institution to which these patients could be sent, and there could be no thought of any personal profit in the giving of such talks.

DR. THOMAS S. CULLEN, in closing, stated that when Dr. Neil undertook the location of his patients and to find out the after-results of operations, gynecologists became pessimistic and as the reports came in this pessimism cleared up. He agreed with Dr. Peterson that it was not an operation that one was eager to perform.

Replying to a question asked by Dr. Peterson, he said general surgeons in replying to his circular letter complained that they did not get the cases. Women evidently know where to go. There was no harder operation in abdominal surgery than that of the removal of cancer of the cervix, and surgery of the upper abdomen in comparison with it was mere child's play, so there was no likelihood of cancer of the uterus and cancer of the cervix falling into the sphere of general surgery unless the operations be done by general abdominal surgeons. He imagined it would be a good scheme for those who thought that the cautory operation was the one to do, to perform it. On the other hand, those who thought the Wertheim operation, or the radical abdominal operation was the proper one, should do it. Then each man having quite a number of cases could compare notes and gradually come to the point where we were able with fair accuracy to tell which method would give us the best results.

DR. BOVEE, in closing, desired to emphasize the very small percentage of operable cases among those that were seen; also the necessity for studying the characteristics and the life history of cancer of the uterus.

At the conclusion of the discussion, Dr. Reuben Peterson moved that the three men who had been doing the most in regard to the propaganda of cancer of the uterus, namely, Drs. Broun and Taylor of New York, and Taussig of St. Louis, be appointed a committee with this specific object in view; that they draw up a plan of action and present it at the next meeting of the Council, which would take place in November or December,

and that the Council be empowered by the Society, after looking over the plan, to take what action it might see fit.

This motion was seconded and carried.

SYMPOSIUM ON THE END RESULTS (TWO-YEAR LIMIT) OF OPERATIONS FOR COMPLETE PROCIDENTIA OF THE UTERUS.

- (a) *In child-bearing women.*
- (b) *In women after the menopause.*

CONSIDERATION OF THE MODERN METHODS OF TREATMENT OF PROLAPSUS UTERI WITH THEIR ADVANTAGES AND DISADVANTAGES.

DR. E. E. MONTGOMERY, Philadelphia, in a paper with this title emphasized particularly that no one operation was applicable to every form of displacement, as in some it affected the anterior wall of the vagina, in others the posterior, and in still others the uterus, which protruded through the vagina. In those cases of displacement of the posterior wall of the vagina, commonly known as rectocele, the condition was primarily relieved by the employment of plastic operations upon the posterior segment of the pelvic floor. The simplest procedure was to lift a flap of the posterior wall of the vagina, pushing backward the tissues, often even the peritoneum, and bringing between the rectum and vaginal flaps the levator ani muscles; in other words, a rectovaginal interposition of these muscles. This insured against pushing out of the rectum, effected better evacuation of the bowels, and was a procedure which should supplement all operations for prolapsus.

In protrusion of the anterior wall of the vagina, known as cystocele, a number of operations had been devised, such as the plastic operations which consisted in partial resection of the anterior wall and in the separation and anchorage of the bladder at a higher point in front of the uterus. Coffe opened the vesico-uterine flap of the peritoneum and secured the uterus forward by shortening the round ligaments, then anchored the bladder higher and retracted the anterior vaginal wall. In cases, however, in which the uterosacral ligaments were relaxed or overstretched, the uterus was likely to drag upon its round ligament anchorage and reproduce the lesion. Watkins interposed the fundus of the uterus between the bladder and anterior vaginal wall. This procedure necessitated sterilization of such patients as might become pregnant. The operation should be limited to senile or small uteri. Where the organ had a long cervix, or the ligaments were sufficiently rigid to cause the uterus to resume its former attitude, a sulcus formed in front of the fundus which might lead to vesical incontinence.

In other cases the interposed uterus with bladder and vagina might be protruded. Not infrequently the mesosigmoid and mesorectum with a considerable part of the rectum dropped

down into Douglas' pouch, increasing the pressure and promoting extrusion. In such cases shortening the ligaments, ventral suspension or fixation would only afford temporary relief as the uterus would drag upon its anchorage. It had been his custom in such cases not only to shorten the ligaments, but to plicate the peritoneum between the sacral promontory and the posterior surface of the cervix, securing these folds to the side and front of the rectum which formed a shelf on which the superior part of the rectum might rest. This procedure held the uterus across the pelvis and precluded its subsequent projection.

Polk devised an operation which consisted in folding the vagina through an incision of the vesicouterine peritoneum. This operation had also been described by Brenner.

Where the uterus was large, the cervix and vagina edematous, and covered with gravity sores, and the vaginal walls thickened, the better plan of procedure was to do a vaginal hysterectomy. The vessels were ligated, the upper part of the broad ligaments temporarily secured with clamps. After ligation of all bleeding vessels the peritoneum was united over the posterior surface of the bladder and vagina, and the broad ligaments were made to overlap each other in the median line, and the sutures so introduced as to take up the slack of the bladder and rectum. The vaginal surfaces were then united transversely over the fundus and a vertical line in the anterior wall. The important consideration of the operation was to secure the structures from subsequent hernia.

#### PROLAPSE OF THE UTERUS.

DR. J. M. BALDY, Philadelphia, said that during the recent Congress of Surgeons held in Philadelphia, he demonstrated the surgical cure of several cases of prolapsus uteri, and was somewhat surprised during subsequent discussion to find more than passing interest manifested in the methods he had resorted to in order to obtain a cure.

He was personally unable in every case to assure all his complete prolapse patients of a reasonably sure cure without the aid of an intraabdominal operation.

In 1895, he published a method of dealing with prolapse of the uterus which he had been experimenting with for some years, the essential parts of which were a vaginal hysterectomy and fixation of the stumps in the vaginal vault. Concerning this, in 1898, he said: "The operation should be performed with ligatures, and the stumps fastened into the vaginal opening, so as to draw the vagina upward during the process of contraction and repair and give that organ a permanent support from above which can be obtained in no other way." This operation in a very few picked cases may even be done to-day.

Not getting as good final results continually as he desired, in 1898, after a few years experiments from the abdominal side,



he published a second method. The procedure was in all essentials an abdominal hysterectomy by amputation at or below the internal os. The points to be observed were: 1. to include both the ovarian arteries and the round ligament in the first ligature on each side of the uterus. 2. To place this ligature as near the pelvic wall as possible so as to leave but a small amount of broad ligament behind with the stump. 3. To place but one other ligature on each side of the uterus, this ligature to include the uterine artery with as little other tissue as possible. This left both broad ligaments open. 4. To amputate the uterus as low on the cervix as possible.

The result of the operation was as near perfect as was possible by any operative procedure. The results accomplished were: The weight of the heavy uterus was removed; the overstretched vagina was lifted high up and held firmly in place; the supports utilized were the natural supports of the uterus and the upper portion of the vagina, the broad ligaments. The cervix remained a pelvic organ as was natural to it. The immediate and remote results as regards fixation of the upper part of the vagina were perfect.

In cancerous or tubercular disease of the uterus the operation might be varied by performing a panhysterectomy. The vaginal mucous membrane was to be sutured together, closing off the vagina. The vagina could then be brought up and fastened to the stumps in a similar manner as when the cervix was not removed.

The same year and in the same work he published a further effort in the direction of permanent efficiency and in connection with this operation stated: "Another and excellent modification of this operation is, after the uterus has been removed by amputation at or below the internal os, to fix the cervical stump to the abdominal wall at the lower angle of the abdominal incision by means of two silkworm-gut sutures passed through the full width of the cervix from side to side, and the free ends brought through the peritoneum, muscles and deep fascia of the abdominal wall, where they are securely tied together, cut off short, and the knots buried when the incision is closed. The open broad ligaments should be closed by a continuous catgut suture on each side, preferably before the cervix is anchored by fixation sutures."

Experience with this operation taught him this fact, that it was possible to attach the cervix so far away from the pubis as to defeat the object desired to be obtained. In the early days, one case returned to him with the vagina again prolapsed, and he assumed that the attached cervix had been torn from its anchorage. A second operation demonstrated the fact that the cervix was perfectly attached at the point of fixation, but that this point was so far away from the pubic bone as to allow the abdominal wall being pulled in by the traction below and a reproduction of the descent of the upper vagina. Since that



time he had made the attachment as near the pubic bone as it was possible to approach, and no further failure had been recorded.

Prolapsus occurred in women in whom it was desirable to retain the child-bearing function, and in these cases in the past he had depended largely on plastic work with indifferent results.

The operation he had been performing for some years to restore a retrodisplaced uterus by bringing the round ligaments posterior to the uterus, was at first extended to those cases of retrodisplacement accompanied by a prolapse of the vaginal vault to a moderate degree.

During the Congress referred to, in one case he further extended the application of this operation to a case of complete prolapsus of the uterus and vagina, and found the results so satisfactory that in future in such cases he should use it extensively. Any one who was in the habit of performing this operation for displacements would readily realize how thoroughly it elevated the pelvic organs and retained them in place in such a firm manner as was possible by no other operation performed for displacement.

Recently in several cases in which the operation had been performed, there had existed an inguinal hernia. When the round ligaments had been adjusted to the posterior part of the uterus it was found that the opening into the inguinal canal had practically disappeared. The pull on the ends of the ligament had brought the borders of the ring nearest the pelvis backward, closing the canal so completely by overlapping that the opening could only be demonstrated by the examining finger with difficulty. A stitch or two was in each instance introduced supplementing the closure and overlapping of the ring and nothing further done for the hernia. The idea was to follow the subsequent history of each case and see what the permanent result would be. If it was proven that this operation would cure inguinal hernia, an additional feature of value would have been added to it which would make it an operation difficult to duplicate.

THE PRINCIPAL INVOLVED IN THE OPERATION FOR THE RELIEF  
OF PROCIDENTIA UTERI WITH RECTOCELE AND CYSTOCELE;  
REPORT OF CASES.

DR. J. RIDDLE GOFFE, New York, developed in his paper the importance in all plastic operations of reestablishing physiological function. To accomplish this, anatomical reconstruction must also be secured, and the two going hand in hand would give us a *restitutio natura*, by which the functions would be performed as intended. In the operations for restoration of the pelvic organs no correct idea of what was physiologically correct could be obtained without a knowledge of intraabdominal pressure. It had been customary to consider intraabdominal pressure as identical with hydrostatic pressure, but this failed to explain all the phenomena which were found in the abdominal and pelvic

cavities, and for the reason that these cavities had not only elastic walls, but also part of the cavity was surrounded by hard inelastic structures. That in addition to this, these cavities contained organs of varying density and degrees of mobility which, instead of conducting hydrostatic pressure equally in all directions, retarded its progress in its passage through these tissues and caused reflection and deflection of pressure according to dynamic laws. An important feature of this were the deflecting planes. The whole tendency of intraabdominal pressure was to produce continuous motion especially in the intestines, which usually carried their contents continuously toward the outlets in the pelvis. In the pelvis the uterus and the broad ligaments when in normal position, afforded a most important reflecting plane to this pressure. There were no ligaments sufficiently strong to withstand for any length of time the force that was brought to bear upon them. It was only by deflecting this force from the surface that their normal position was maintained. The uterus and its broad ligaments acted like a teeter board, with its long arm in front and the short arm posteriorly.

In child-bearing women the uterus was retained and restored to its normal position by the shortening of the uterosacral and the round ligaments. In cases of extreme procidentia, especially in women beyond the child-bearing period, the uterus was removed, but the deflected plane of tissue was maintained by stitching together the broad ligaments across the pelvis. The round ligaments were retained and still assisted in tilting this plane of tissue so as to deflect intraabdominal pressure as before. It was, therefore, diverted from its original direction where it would tend to force the contents of the pelvis out of the vagina. The other prominent feature of the operation was the restoration of the bladder to its normal position and function.

In its function the bladder might be divided into two hemispheres, the upper and the lower. The lower portion was separated from the upper by hinges which extended across the front of the uterus out into the broad ligaments and from those points back to the internal mouth of the urethra. The meeting of these hinges on the broad ligament was called by Kelly the cornua of the bladder. By spreading the base of the bladder upon the uterus and its broad ligaments in the simpler cases, and upon the broad ligaments in the more serious cases, where the uterus had been removed, we restored the trigone of the bladder to its normal position, fixed it there, so that the function of the ureters was not interfered with and permitted the upper hemisphere or dome of the bladder to rest and fall normally.

A series of forty-four cases was presented in which this operation had been performed, the period of time elapsing since the operation extending from two to five years. On examination of all these cases it proved entirely satisfactory with one exception. In that case the exact condition could not be learned, for it was impossible to obtain an examination.

By letter, however, the patient said the bladder had dropped a few months after operation, but now she was busy dressmaking and was very comfortable. In these examinations there were eleven patients between the ages of fifty years and sixty years, four between sixty and seventy, and one at the age of seventy-five. In not one of them was there sufficient reaction from the operation to demand any departure from the regular routine after-treatment. The old lady of seventy-five was now seventy-nine years of age, and on the anniversary of the operation, May 17, walked across the city a distance of nearly a mile. Asked how she felt, she replied, "You have made a new woman of me." Another patient of sixty-three said, "I feel as good as new." Convalescence was surprisingly smooth after this operation. Catheterization was not continued as a rule beyond the second day.

Regarding the action of the bowels, all patients expressed gratification at the ease with which defecation was accomplished. While much of this could be attributed to the restoration of the levator ani muscles, much of it was attributed also to the deflecting power of the broad ligaments as restored to their normal function. At the present time all of these cases were examined previous to operation by the cystoscope and also after operation. Dr. Osgood, the cystoscopist at the Woman's Hospital, reported complete restoration of normal conditions in the interior of the bladder. The mouths of the ureters were in normal position and relation, and the interureteral ridge was also restored.

Two cases had become pregnant and borne children at full term two years after operation. One of these babies weighed 11 pounds at birth, and the other was also of large size. In neither case was there the slightest lesion. In short, it was rare to see two cases in parturient women where less damage was done than in these two instances. There was no weakening or destruction of any important tissue.

PROCIDENTIA OF THE UTERUS TREATED BY PPLICATION OF THE  
VAGINA AND CONJOINED SHORTENING OF THE  
UTEROSACRAL AND BROAD LIGAMENTS.

DR. WILLIAM M. POLK, New York City, said that the purpose of the operation was to remedy the defects without removal of the uterus, ovaries or tubes. Two cases became pregnant subsequently and carried their children to term. Eight cases retained all the benefits two years from the date of operation. The bladder was separated from the vagina as far as the urethra. The entire anterior vaginal wall was then folded in by suturing the sides of the vagina together with kangaroo tendon. The uterosacral and base line of the broad ligaments were conjointly shortened by a ligature which encircled, above the uterine artery and within the ureter, the lower half of the broad liga-



ment and the uterosacral fold. One-half an inch from the uterus for the broad ligament, and an inch from the uterus for the sacral fold. These sutures, one for either side, were drawn forward and passed deeply into the tissue of the utero-vaginal region and tied. Kangaroo tendon was the material used for the plication and for this shortening. Additional sutures were used to fasten more securely the tissues brought forward from the broad ligament and uterosacral fold, to make the anchorage more secure. The fold produced by the plication at the anterior vaginal wall was now incised from below, turning back excessive tissue, it being trimmed off only where necessary, and the surfaces brought together by through-and-through sutures. In this way a strong supporting column was given to the base of bladder, the whole being swung by taking up the slack in the lateral vaginal attachments, and by shortening portions of the broad ligament and uterosacral as had been mentioned above. The operator had carried out the procedure on eighteen cases without any undue shock or hemorrhage, and with good recovery in each case. In his experience he reported the operation as entirely feasible and proper save perhaps for very old people. Even with them, however, unless there was some serious complicating disease present, he would employ it.

The paper was illustrated with drawings and lantern slides.

THE END RESULTS WITH VARIOUS OPERATIVE PROCEDURES FOR  
PROCIDENTIA UTERI AND EXTENSIVE CYSTOCELES  
PRIOR AND SUBSEQUENT TO THE MENOPAUSE.

VAGINO-FIXATION OR TRANSPOSITION OF UTERUS AND BLADDER.

DR. HIRAM N. VINEBERG, New York, said the ideal operation for procidentia uteri with marked cystocele in women approaching or past the menopause was vagino-fixation or transposition of the uterus and bladder. He was the first in this country to perform and describe the operation. (*American Journal of Gynecology and Obstetrics*, Jan., 1894, and *New York Medical Journal*, October, 1894.) The technic corresponded in all essentials to that which had been described within recent years as transposition or interposition of the uterus and bladder. The operation was devised originally for backward displacements, but it was soon recognized that it found a suitable field in downward displacements, and more especially in those associated with extensive cystocele.

The author deemed it important to separate the bladder freely from the uterus and laterally from the base of the broad ligaments in order to obtain a good result. He almost invariably did a high amputation of the cervix and a posterior colporrhaphy at the same seance. The number of cases he had had under observation for two or more years was forty-five. In not a



single instance had there been a recurrence of the prolapse or of the cystocele. In three cases there was a recurrence of the rectocele.

The vaginal operation the writer employed during the child-bearing period was the one devised by him in February, 1894, and consisted in suturing the round ligaments to the vaginal wall. He described fully the steps of the operation with the aid of several illustrations. This operation he performed only in very obese women, or in those who had a mortal dread of an abdominal section. Several cases of marked prolapse with retroflexion had been traced, on whom the operation had been done, two or more years before. In one there was a failure due to a severe bronchitis, attended with a violent cough, immediately after the operation. In a second case there was a slight protrusion of the anterior vaginal wall when the patient was requested to bear down. In the remaining cases the results were excellent, one patient having gone through a pregnancy, and having had a normal labor without any recurrence of the prolapse or cystocele.

The abdominal operation the writer performed for procidentia during the child-bearing period, consisted in a modification of Olshausen's method of suturing the round ligaments to the abdominal wall. He preferred this operation to all others, unless the patient was unusually fat. He had described and illustrated the technic recently.

Seventeen cases in private practice had been under observation for two years or longer. There had been three deliveries at full term, one patient had two, and another had one. The pregnancies, labors, and puerpera were normal in every respect. The women were examined afterward. In none of the seventeen cases had there been a recurrence of the prolapse or of the cystocele.

#### OPERATIVE TREATMENT FOR SO-CALLED FUNCTIONAL DYSPEPSIA.

DR. WILLIAM H. WATHEN, Louisville, contributed a paper on this subject. It was his contention that the term "functional dyspepsia" should be eliminated from our nomenclature, for if it ever existed it was so infrequent as to be negligible. Every case of continued or inveterate dyspepsia or dyspepsia disappearing and recurring at regular intervals was antedated by a pathology in some part of the body, but in the large majority of cases the lesion would be found in some abdominal viscus, as the appendix, the gall-bladder, the stomach, the duodenum, the large or small intestine, or the uterine adnexa. In other cases the pathology might be in the arteries or kidneys—arteriosclerosis and chronic nephritis. The relative frequency of etiologic lesions might be as follows: Appendicitis, gastric and duodenal ulcer in the male, gall-stones and pelvic infection in the female, sclerotic ovaries and partial obstruction of the

intestines by adhesions, or tumors (benign, tuberculous or malignant). These were the cases described in text-books on medicine as functional dyspepsia, acid dyspepsia, flatulent dyspepsia and hyperchlorhydria. These errors in diagnosis had been religiously copied in the best text-books on medicine, and handed down for generations, and it was entertaining to read the beautiful descriptions of the symptoms of functional dyspepsia by many of these older writers on medicine. Who could surpass in beauty of style in the descriptions of the symptoms and signs in a clinical history of a case of dyspepsia written by Watson, Brinton, Johnson and other writers on medicine fifty or more years ago? These errors could not then have been avoided, because these men had no way of confirming the diagnosis except by an occasional postmortem, and even then the dead pathology was so unlike the living that it gave an imperfect conception of the primary etiologic lesion. These mistakes in diagnosis might now be easily avoided if the physician would follow his patients to the operating room of the surgeon and see the living pathology. He would then not have to base his diagnosis more upon fancy than fact, or more upon theory than sight in the surgical clinic. This had all been done by the abdominal surgeon who now cured these cases by the removal of the pathology, and the majority of them could not be cured otherwise, just as we could not cure a patient with cholelithiasis except by the removal of the gall-stones and drainage of the gall-bladder and bile ducts. Unfortunately too many of these cases came to the surgeon, after many years of intermittent dyspepsia, who had been treated by medicine, lavage, etc., sometimes temporarily curing the symptoms, but not the disease.

By a careful study of these cases we could find a pathologic condition that must be removed to cure the patient. The symptoms of calloused duodenal or gastric ulcer were nearly pathognomonic, and a correct diagnosis could usually be made by a study of the history of the case, and the same in a less degree might be said of dyspepsia caused by gall-stones or appendicitis. A differential diagnosis might not in every case be possible, but with the fewest exceptions a diagnosis of a lesion in an abdominal viscus that must be removed could easily be made. For nearly every case of gastric or duodenal ulcer, of gall-stones or appendicitis would give symptoms if we would correctly study the history. The pathology was often in more than one viscus, and the failure to recognize this had caused operative failures. It was his practice in nearly every abdominal section to examine the stomach, duodenum, gall-bladder, appendix, and other abdominal structures, and this should be done by all abdominal surgeons. This in some cases might not be permissible. We would frequently find an association of appendicitis with duodenal and gastric ulcer and less frequently with gall-stones, the appendicitis appearing to be of longer duration. This association of appendicitis sustained the belief that the infected appendix was

an etiological factor in duodenal and gastric ulcer, and might be in gall-stone disease.

Dyspepsia caused by appendicitis or gall-stones, with no stomach or duodenal lesion, could be cured by the removal of the appendix, or by the removal of the stones and drainage of the gall-bladder and bile ducts. In gastric ulcer the lesion should be excised, or if this was not possible, it should be infolded by linen sutures introduced deep enough to include the blood-vessels around the ulcer. If there was obstruction to the passage of food from the stomach, a posterior gastrojejunostomy should also be made. The duodenal cases might, with few exceptions, be cured by a posterior gastrojejunostomy, but the ulcer should be infolded as in gastric cases, for this removed all immediate danger of perforation. The excision of a gastric ulcer was important because of the fact that 75 per cent. of carcinoma of the stomach had their origin in a chronic ulcer. As carcinoma was seldom, if ever, primary in the duodenum, the excision of the ulcer was not often indicated, as in ulcer of the stomach.

#### OFFICERS.

The following officers were elected for the ensuing year: President, Dr. Henry C. Coe, New York City; Vice-Presidents, Dr. George H. Noble, Atlanta, Georgia, and Dr. George Gellhorn, St. Louis, Missouri; Secretary, Dr. Leroy Broun, New York City, and Treasurer, Dr. J. Wesley Bovee, Washington, D. C.

Washington, D. C., was selected as the place for holding the next annual meeting.

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## TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF PHILADELPHIA.

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*Meeting of May 2, 1912.*

*The President, GEORGE M. BOYD, M. D. in the Chair.*

#### SYMPOSIUM ON ORGANOTHERAPY.\*

Papers were read by Drs. Sajous, Hare, Reynolds, Krusen.

#### DISCUSSION.

DR. J. M. BALDY.—I hesitate to open the discussion upon a subject concerning which absolutely nothing new has been put before us. Dr. Sajous offered the only new thought, viz., that with the exception of the thyroid, parathyroid and suprarenal glands there is no internal secretion. In this connection he shows that in every case in which such a claim is made the presence of adrenalin in the tissue of the gland can be positively shown and

\* For original articles, see pages 509, 514, 518 and 522.



the physiological action produced is exactly that of adrenalin, viz., high blood-pressure. Beyond this, what has been put before us is assertion with no attempt at scientific proof and the quotation of a few isolated cases in connection with names difficult of pronunciation and largely unknown foreigners. We have had many of these extracts before us for years and if there was much merit in them or any true basic principle back of their administration we would all be using them and producing results. The contrary is true, few of us use them, those who do only occasionally report a case of benefit and as far as ovarian and mammary extracts are concerned, those who have taken them up have largely dropped them as useless. There is no reason to believe that the extract of the corpus luteum is of any medicinal use. If it has any physiological action it is that of adrenalin and is due to the adrenalin contained in the organ. As a matter of fact it is highly absurd to suppose that because you mash up a gland and from its juices get a physiological action, that that particular organ gives off an internal secretion and that this internal secretion is similar to the juices produced by crushing, etc. It is the old ridiculous "post hoc ergo propter hoc" line of reasoning, which the world has long since laughed out of existence. There is absolutely not an iota of sound scientific fact to prove that the ovary or any part of it has an internal secretion. It is quite sufficient for that organ to take care of the function of ovulation and its accompaniments. The girl before her ovaries are developed is feminine in all her instincts, the child-bearing woman is the same as is also the grandmother who has had her ovaries atrophied, and I defy any one of you to show me the patient from whom you have removed the ovaries who is any the less feminine than any other woman, old or young. You may claim it is a fair subject for further thought and investigation but to claim that it is proven in a single case aside from these mentioned above, thyroids, parathyroids, or adrenalin, is absurd in the highest degree and only serves to throw doubt on our reasoning ability.

DR. E. E. MONTGOMERY.—I do not feel that I can add anything to what has been said, but as I have listened to the papers on the subject I have been impressed with the statement that separate contraction of the uterus occurs without simultaneous contraction of the cervix and I would question the advisability of the administration of pituitrin before the expulsion of the placenta. Its administration necessarily renders delivery of the placenta difficult as a drug which contracts the uterus also contracts the cervix, unless so situated as to act as a dilator. Did I believe in the value of the drug sufficiently to lead me to administer it, I should hesitate greatly about its administration prior to the emptying of the uterus.

DR. WILLIAM R. NICHOLSON.—As far as the pituitrin is concerned, I have had a little bit of experience with it. Dr. Mont-



gomery's remarks are well worth considering. There have been some reports among recent investigators which seem to imply that pituitrin given before the expulsion of the child may, in certain cases, cause just the dangers Dr. Montgomery speaks of. I am not absolutely sure that pituitrin is a perfectly harmless drug given in the early part of labor. At the University we have used it in a few cases, enough to make us suspect that it has an influence equal to good ergot. I believe that pituitrin and ergot in combination work better than pituitrin alone. In cases of miscarriage, for instance, the pains are at times distinctly lessened by the use of pituitrin. In using it, however, I feel that we should remember that it will possibly cause the contractions spoken of by Dr. Montgomery. It seems to me that the strongest indication for the use of the drug is to check bleeding after delivery. When ergot was first used many preparations were found to be inert, but in the active preparations a certain number of cases did badly. Only recently, however, a man of considerable experience said he had gone back to the use of ergot before delivery of the child and was having no trouble. He probably was using an inert substance. I agree with Dr. Montgomery that the pituitrin is of great advantage after delivery in case of hemorrhage. I doubt, however, the advisability of its use as a uterine excitant, believing that we have safer means.

DR. CHARLES P. NOBLE.—The Society is to be congratulated upon this symposium drawing attention to the ductless glands and their function. It is to be hoped that the interest of the members may be stimulated and thus lead to further work of investigation in this field. I have had experience with only two of the extracts of the ductless glands—the thyroid extract, and adrenalin. It seems to me that the evidence is largely in favor of there being an internal secretion of the ovary, but also that there have been some very wild statements made regarding it. My own reading and experience lead me to believe that Dr. Baldy is correct in feeling that there have been great exaggerations made. I have had many opportunities for observing the symptoms of the artificial menopause, and I long ago came to the conclusion that most of the exaggerated symptoms of the artificial menopause are due to a neuropathic state in the particular women. I have had considerable experience with the thyroid extract and my feeling is altogether in accord with the views of Dr. Sajous. I have seen many striking results follow its administration in failure of metabolism. Small doses of thyroid extract have cleared up in what appeared to be a marvelous manner the effect of metabolic poisons. The most striking results were seen in a patient with alcoholic insanity. It was a very pronounced case in which the patient was becoming demented. The patient was put upon 2 grains of thyroid extract and in four days the symptoms of dementia entirely disappeared. The drug was stopped and the dementia reappeared. It was again given with reappearance of normal intellection.

I was particularly interested in the paper of Dr. Sajous and feel that we are all under great obligation to him for his pioneer work with reference to the ductless glands. I can understand the allusion to the early opposition on the part of the profession, and I am sure that Dr. Sajous must feel gratified at the very different attitude of those in the profession who are interested in the subject and carrying on investigations. I feel confident that he will see the time in which his work will be more fully appreciated than it has been in the past.

DR. JOHN A. MCGLENN.—I have little to add, except to acknowledge that I am one of three physicians in the audience who believe in the efficacy of the extract of the corpus luteum. I use it as a routine following operations for the total extirpation of both ovaries. The symptoms of the artificial menopause are held in abeyance by its use, and it has given good results in every case in which I have used it.

In reference to the extract of the pituitary bodies I have been inclined to use it upon the recommendation of Dr. Hirst. Dr. Scott, who has been working with Dr. Ott at the Medico-Chirurgical Hospital, says that a number of cases in which there was marked toxic symptoms have been benefitted and a recurrence of symptoms prevented for a long time. As Dr. Montgomery and Dr. Nicholson have said I think the danger in the use of pituitrin should be borne in mind. At the meeting of the Clinical Surgeons of North America it was stated that 95 per cent. of the toxemias could be cured by using thyroid extract. I am free to confess that I believe that many cases of the toxemias of pregnancy can be benefitted by the use of the thyroid extract.

Regarding the question of an internal secretion of the ovaries, it is unquestionable that when the ovaries are taken out there are changes which take place in the body, physically and nervously, which can be cured by the implantation of an ovary in the popliteal space, and such nervous symptoms can be cured or held in abeyance by the exhibition of corpus lutea. Whether that is conclusive for Dr. Baldy, it is for me. It is obvious that the ovary has something in it, which if taken away, creates certain symptoms, and which when replaced causes those symptoms to disappear.

DR. SAJOUS, closing.—I have nothing to add, except to thank the Society for its courtesy in inviting me to take part in a symposium upon this subject.

DR. HARE, closing.—Of course, the members of the Obstetrical Society must fully appreciate the fact that my function to-night was simply to present certain facts in regard to the therapeutic action of these glands upon various portions of the body which are of interest to obstetricians and gynecologists, and I had no intention of intimating when these extracts should be used indiscriminately. I think perhaps Dr. Montgomery misunderstands me if he got the impression that pituitrin can be given with perfect safety under any circumstances. I do not believe there

is any drug capable of producing a good effect which is not, when wrongly used, capable of producing a harmful effect. Thirty years ago Dr. Baldy held just the same views upon all questions as he does to-day. He has made a very sweeping statement in regard to organotherapy. It is quite inconceivable that a man with his eyes and ears open can take the position he has taken. It is possibly true that none of us have been able to present anything new. I, perhaps, ought to plead guilty to that, but I do assert the facts that these ideas are worthy of our closest study.

DR. WILMER KRUSEN, closing.—I do not come before the society as a special pleader in favor of ovarian extract. Several years ago I read a paper on this subject before the Johns Hopkins Medical Society and it had rather a similar reception to that of to-night. Eighteen or nineteen years ago when I entered this Society Dr. Baldy used to frighten me very much. He does not any more, I simply ask him whether he has ever used the extract in any single case, and as he has not, his arguments are valueless.

DR. STEPHEN E. TRACY reported a case of

#### SARCOMA OF THE VAGINA.

Sarcoma of the vagina is so rare an affection, that McFarland (*American Journal Medical Sciences*, April, 1911) who made a statistical study of the subject in 1911 found only 101 cases in the literature, and with the case he reported, 102 up to that date. The case I have to report is as follows:

Mrs. E. E. æt. fifty-five, cigar maker. She had had seven children and no miscarriages. When the patient came under observation on September, 5, 1910, she complained of bleeding and of a lump in the right side of the vagina.

Patient had had the usual diseases of childhood: typhoid fever, la grippe, and tonsillitis. Father died of heart disease; mother died of cancer at the age of sixty years, location of growth not known.

She had worked hard but stated she had enjoyed good health until a few months ago. About a year ago she noticed a lump in the right side of the vagina near the vulvar margin. Some months later the tumor was removed by a female surgeon. Eight weeks after the operation she began to bleed from the vagina.

At time of examination she complained that the lump in the right side of the vagina was increasing in size. She stated that at first the lump was white, but later became purple. When the labiæ were separated a large purple-colored mass in the right side of the vagina beneath the mucous membrane was seen. The tumor was hard, slightly movable and extended from the vulva to the vault of the vagina, and around the right side of the pelvis from the bladder to the rectum. On the under surface of the tumor at the vulvovaginal margin, there was an eroded surface; the tissues were friable and bled freely on the slightest touch. The tumor was considered a malignant growth.

The patient was admitted to the Stetson Hospital and sub-



jected to operation on September the twelfth. An incision was made through the vaginal wall over the tumor, the sarcomatous tissue removed as thoroughly as possible, and the Paquelin cauterizer applied to every accessible point. Bleeding was profuse but was controlled by packing with gauze saturated with Burn's styptic mixture. The packing was removed at the end of three days, and at the end of a week x-ray treatments were started.

The patient was made comfortable by the operation, but four months later the pelvis was so filled with the sarcomatous growth that she had great difficulty in evacuating the bowels; the bladder could be emptied only by the catheter, and the suffering was intense. There was no evidence of metastasis at this time. The patient was not seen again, nor could she be located by the family physician. By consulting the Records of the Department of Vital Statistics, I learned that she died on May, 19, 1911.

Microscopical examination showed the tumor to be a sarcoma of the round cell type.

Sarcoma of the vagina may occur at any period, from birth to extreme old age. The greatest percentage of cases occur, however, in infancy, Sarcoma botryoides, the "grape-like" sarcoma.

Sarcoma of the female organs of generation may arise in the ovary, corpus uteri, cervix uteri, vagina, rectovaginal or vesicovaginal septum; and in the vulva. The progress of the disease is rapid and the mortality high. Few, if any cases recover permanently. McFarland found one case reported in which the child lived six years. The case I have reported, survived the disease according to the history obtained, over twenty months. The records at the hospital, where the first operation was performed one year before the patient came under observation, show that the tumor was noted nine months before the patient was admitted to the Institution, which would make the duration of the disease about two and one-half years.

From the observations of this case, x-ray treatments would seem of doubtful value, and it is a question if the recurrence was not hastened by the treatment. The treatments were given over the perineum and above the pubic bone.

Last year we had another case of sarcoma of the vagina in Miss. A. B., æt. thirty-two. The growth was about the size of a walnut, freely movable, situated in the vesicovaginal septum about three centimeters within the vagina. The tumor was removed and microscopic examination showed it to be a round-celled sarcoma. The result in this case is not known, as the patient passed from observation about two months after being discharged from the hospital. When last seen there was no evidence of a recurrence.



## CORRESPONDENCE.

## COMBINED STERILIZER AND DOUCHE CAN.

TO THE EDITOR OF THE AMERICAN JOURNAL OF OBSTETRICS AND  
DISEASES OF WOMEN AND CHILDREN.

DEAR SIR:

I am enclosing photograph of a sterilizer and douche can for obstetrical cases which I have found of very great convenience in my work and which you may think worthy of publication.

The illustration shows an instrument sterilizer and douche can combined. The sterilizer has been turned into a douche can by the addition to it of a long metal tube, reaching to top of can and connected near the bottom by a swing ball joint which allows the metal tube to be completely folded or lowered, thus having a douche ready at a moment's notice. The end of the metal tube fits ordinary size rubber tubing. The diameter of the can is 8 inches.



The height of can is 17 inches with cover, making it deep enough to stand obstetrical forceps in it and allowing room for other instruments and rubber tubing which may be boiled in the can. The end of the metal tube is corrugated for the attachment of the rubber tubing. This combination allows one to use the sterile antiseptic solution in which the instruments are boiled as a douche, at a moment's notice, when it might be needed for post-partum hemorrhage or before or after instrumental delivery.

The can is of polished copper with fiber-covered brass handles and brass tube and joint with outside quart markings and was made for me by The Kny Scherer Co. of New York City. A somewhat similar arrangement is described in Jellett's Midwifery, Second Edition, page 992.

TIMOTHY F. COHANE, M. D.

NEW HAVEN, CONN.,  
Sept. 1, 1912.

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## REVIEWS.

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AUGUSTUS CHARLES BERNAYS, A MEMOIR. By THEKLA BERNAYS. St. Louis, C. V. Mosby Company, 1912.

This little volume is a personal record of the life and achievements of one of our well-known Western surgeons, and is written in a warm and lovable spirit by the sister of the subject of the book. The material was gathered as the result of a long personal association with her brother and is combined in a most attractive and interesting manner. Dr. Bernays' life extended through the formative period of American surgery beginning at a time when it was still considered necessary for a candidate to obtain the essential part of his medical training abroad. Dr. Bernays was fortunate to have been able to associate with some of the best known men in Germany, including Gegenbauer, Fürbringer, Simon, Czerny, and others, most of whom acted as his personal instructors during the medical course at Heidelberg. The volume forms a very interesting contribution to the historical material which is now being accumulated about our well-known American medical men.

ESSAYS ON GENITO-URINARY SUBJECTS. By J. BAYARD CLARK, M. D., Assistant Genito-urinary Surgeon to Bellevue Hospital; Consulting Genito-urinary Surgeon to the Elizabeth General Hospital; Fellow of the New York Academy of Medicine; Member of the American Urological Association; Member of the American Association of Genito-urinary Surgeons, etc. New York, William Wood and Company, 1912.

This book contains a series of papers which have been published in various medical journals, and includes chapters on cystoscopic diagnosis, tuberculous kidneys, responsibility of the physician in gonococcic infection, gonorrheal prostatitis, comparative value of some urethral and other germicides. There is also inserted a chapter on the general topic as to whether genito-urinary surgery is justified as a special branch of medicine. The concluding chapter deals with the gonococcus from the academic viewpoint, in which the problem is well stated but no solution offered. The book as a whole is very entertainingly written and presents the author's collected writings in a suitable form.

GYNECOLOGICAL NURSING. By ARTHUR E. GILES, M. D., B. Sc., F. R. C. S., M. R. C. P., Surgeon to the Chelsea Hospital for Women; Gynecologist to the Prince of Wales' General Hospital, Tottenham. New York, William Wood and Company, 1912.

Dr. Giles' standing and experience should guarantee the presentation of this topic in a suitable and satisfactory manner, and although the subject matter of the book is presented in a very complete fashion, this may be suggested as the only criticism in connection with the same, for a nurse's preliminary training under ordinary conditions is scarcely advanced enough for this purpose. However, if there are nurses who can take up the care of gynecological cases exclusively, this book will give them the necessary information in a concise and satisfactory form. It is written particularly for English nurses, and in some respects, therefore, is foreign to American practice.

MITTHIELLUNGEN AUS DER GYNAEKOLOGISCHEN KLINIK DES PROF. DR. OTTO ENGSTROM, Band x, Heft 1. (Contributions from the Gynecological Clinic of Prof. Engstrom in Helsingfors.) Berlin, 1912. S. Karger.

The present number contains two articles, the first of which includes an extended study by Tauno Kalima, of the so-called white placental infarct. The writer claims that the genesis of these infarcts is not a uniform process. In advanced stages the primary cause is often impossible to elicit, because secondary phenomena including fibrin deposits, proliferations of the ectoderm and necrosis of the villi disturb the microscopic picture. The intervillous circulatory disturbances, however, are of undoubted significance in this connection, although proliferations in the cells of the ectoderm very often assume an important rôle. Primary hyaline degeneration of the chorionic villi may be traced to this source. The infarct results from a fusion of adjoining areas with stagnation of the included blood and it is quite probable that all infarcts aside from primary clots may be explained in this manner. The fibrin in these infarcts is derived partially from the blood and partially from the hyaline degeneration of the fetal placental elements. Changes in the fetal vessels are secondary and decidual proliferations do not play any part in the production of the infarcts. The study in question has been conducted on a large number of cases and the author also appends an extensive bibliography on this subject. The second article deals with the treatment of pedunculated ovarian tumors which have undergone torsion and is by Grotenfelt. Among 676 cases collected from the literature and including eighty-three observed in Engstrom's clinic, there were thirty-three deaths. The writer believes that the fatal issue is usually due to an autointoxication produced by the absorption of the products of disintegration in the tumor and that this is favored by a chloroform narcosis. For this reason, he believes that particularly in the acute stages this form of anesthesia should be avoided.



## BRIEF OF CURRENT LITERATURE.

### OBSTETRICS.

**Eclampsia in Relation to Atmospheric Conditions.**—Giuseppe Cavagnis (*Ann. de gyn. et d'obst.*, June, 1912) after observing sixty-seven cases of eclampsia has tabulated their occurrence with reference to conditions of temperature, humidity, and barometric pressure, with a view to ascertaining whether conditions of weather and climate influence the occurrence of convulsions. His conclusions are that there is no relation between meteorological conditions and the occurrence of convulsions in the pregnant state; or in the prodromic period. The smallest number of cases occurred in the spring, and at the other seasons they were about equal in number.

**Use of Pantopon in Controlling Pain in Labor.**—W. H. Morley (*Phys. and Surg.*, 1912, xxxiv, 104) says that pantopon, a preparation containing about 90 per cent. of all the alkaloids of opium, of which opium itself contains only 12 to 15 per cent., seems destined to replace morphine and other opium preparations. It can be administered wherever opium and morphine are indicated and has all their therapeutic action without any of their unpleasant and dangerous after-effects. In obstetrics, pantopon tends to lessen the sensitiveness of the uterine contractions without changing the force and duration of the pains. It is harmless for the child. Later investigations must determine the proper time at which to make the injection.

**Treatment of Toxemia and Bacteremia.**—R. Labusquière (*Ann. de gyn. et d'obst.*, June, 1912) calls attention to the pathological importance of the anaerobic bacteria in puerperal processes. Saprophytic bacteria may, under various circumstances, become markedly virulent, and the anaerobic especially multiply in the system, and live in the blood. In cases of putrid abortion aerobic streptococci are not the agents of the putrefaction; they may be met with in the secretions but associated with aerobic germs, which are the true cause of the putrefaction, such as the colon bacillus and aerobic streptococci. Here there is a true infection, and the fever is in proportion with the number of germs present. A splenic hypertrophy is found in almost all the cases in which the blood culture is positive. Schottmuller thinks that we must in all cases at once evacuate the uterus if we would cure the case. On the other hand, Winter believes that active treatment brings about the greatest risks, since it causes migration of the germs from the tissues of the uterus into the blood. Here we should remove all the fragments of the ovum and of the placenta, but should not employ curettage or other active surgical treatment,



especially when hemolytic streptococci are present. Curettage is justifiable only in case of severe hemorrhage threatening the life of the patient. The secretion should be examined for the presence of these germs and if there are no hemolytic streptococci or only isolated ones and saprophytes are found one may curette at once, in case the cervix is permeable, but without brutal measures for dilatation such as will cause traumatism of the uterine lining. If hemolytic bacteria are abundant and in pure culture we should abstain absolutely from interference. The general conclusions of the author are that careful bacteriological examinations of the lochia and blood should be made; the aerobes and anaerobes should both be sought for; such examinations are of value as to diagnosis and prognosis and must determine the therapy.

**Syphilis in Pregnant Women.**—Henri Poucot (*Rev. mens. de gyn. d'obst. et de p  d.*, June, 1912) gives the history of a case which plainly demonstrates the possibility of the wife of a syphilitic man producing a syphilitic child, without being herself infected. The importance of this case lies in the fact that the woman was later plainly infected with syphilis by a second husband; hence the first macerated fetus, the result of marriage with a syphilitic, was not an evidence of syphilis in the mother. She evidently escaped the first infection, to be infected by a second syphilitic man.

**Treatment of Tuberculosis Complicated by Pregnancy.**—Brindeau (*Jour. de m  d. de Paris*, June 29, 1912) thinks that pregnancy aggravates tuberculosis and that its effect is more serious the more advanced the tuberculosis at the time that pregnancy begins. If the tuberculosis is latent, pregnancy will bring about its development. It is necessary for the mother to give to her child for its development a large amount of calcium, and according to the modern theory tuberculosis is a disease that is characterized by a paucity of calcium. Many of the infants born of tuberculous mothers are weak and will soon succumb to malnutrition. The author has found that an early abortion generally benefits the mother, and he thinks that we should disregard the life of the child and produce an abortion before the third month when we believe that the mother's disease will be increased by a continuance of pregnancy. If the pregnancy is more advanced we should allow it to go on and improve the nutrition of the mother as far as possible.

**So-called Therapeutic Abortion.**—Pinard (*Ann. de gyn. et d'obst.*, June 1912) rejects entirely the idea that it is justifiable to cause abortion in cases of sickness of the mother which does not also destroy the life of the child. Prophylactic sterilization is unjustifiable, therefore, this form of therapeutics should not be employed in tuberculosis of the mother. The author has observed in the last forty years, the confinements of 71,225 women at the Baudelocque Hospital, in Paris. Of these twenty-six only have died of tuberculosis after labor. He thinks that it can

be shown that the tuberculous woman is not easily fecundated, which accounts in part for the small number of deaths. If pregnancy occurs, as a rule delivery takes place without any trouble and without injury to the health of the mother. As to the child there have been numberless instances of the birth of a healthy child to a tuberculous mother and of its growing up healthy when properly cared for. In bony tuberculosis he has never seen a recrudescence of the disease after labor. Gestation is a harmonious symbiosis which goes on without injury to the health of the mother. Landouzy has shown that guinea-pigs are not often fecundated while tuberculous, and that abortion does not occur when that happens. Tuberculosis may, in rare instances, be communicated to the child at birth, but this has been shown to be exceedingly rare. Heredity of germs is rare; heredity of dystrophies the author does not consider. He believes it to be the duty of every accoucheur in the presence of a pregnancy in a tuberculous woman to endeavor to better the health of the mother and save the child, and never to consider the possibility of producing abortion artificially.

**Inconveniences in Later Labors of too Complete Restoration of the Perineum.**—A. Bonnet-Labordière (*Jour. de sci. méd. de Lille*, June 29, 1912) tells us that serious complications may ensue in later labors if we repair too carefully the perineum, and sew together too high up the fibers of the levator ani muscles. We may thus cause a stenosis of the vagina, and the tissues in this case are not relaxed by the softening of pregnancy. We should be careful not to freshen too much tissue in these operations, or to create a large amount of cicatricial tissue in the pelvi-perineal region. In this type of stenosis either the parts relax, or tear, or there comes about the necessity of operative interference to deliver the child. Here it may be necessary to cut the tissues in the middle line sufficiently to allow of the escape of the head and shoulders. In a case of this kind observed by the author operation was necessary and was followed by severe hemorrhage due to uterine atony, following a very severe labor. In some cases Cesarean section becomes necessary and the uterus may even have to be removed at the same time.

**Extraperitoneal Cesarean Section.**—G. Acconci (*Ann. de gyn. et d'obst.*, June, 1912) discusses the indications for the extraperitoneal Cesarean section and its relation to the classical operation. In the early days it was advocated in septic cases; but it has been found that its mortality in these cases has been extremely high, and its use in septic cases has been abandoned. Jeannin thinks that comparing the transperitoneal and the extra peritoneal methods the extraperitoneal is theoretically satisfactory, but the results being the same there is no reason why it should be preferred to the transperitoneal. The author reviews the opinions of the various authors who have practised and written on this operation. The author does not believe that the suprapubic operation should entirely take the place of

the classical Cesarean section, which in suitable cases remains the procedure of preference. In cases of simple putridity of the amniotic fluid he thinks that the suprapubic operation should be preferred to the classical one. The extraperitoneal Cesarean section is to be used when the membranes have been ruptured for a long time and there is reason to believe that sepsis will later occur. It is well adapted to the expectant method, but whenever asepsis is secure the classical operation may be employed. The author gives histories of three cases operated on extraperitoneally. The chief difficulty, it appears to him, is how to judge the degree of sepsis that exists in a given case. The author has tabulated all cases operated on extraperitoneally that he has been able to collect from medical literature. He has found 670 cases in all, with thirty-seven deaths, twenty-seven of them in infected cases after the operation. The bad results he thinks are in part due to the newness of the operation and the fact that the technic is not at first familiar to the operator. It is certain that lacerations of the soft parts, such as result from pubiotomy, may be avoided by the extraperitoneal method, hemorrhage is slight, and it is much to be preferred in primiparæ. In cases of expectant treatment it is indicated; also in slightly infected cases, and in primiparæ with slight pelvic contraction when we desire to await the effect of the natural uterine contractions.

#### GYNECOLOGY AND ABDOMINAL SURGERY

**Immediate Influence of Ovariectomy on Menstruation.**—O. Vertes (*Gyn. Rund.*, Bd. vi, H. 8 and 9) reports the results of his observations in a series of sixty-seven cases in which one or both ovaries were removed while the uterus remained. In none of the cases was any vaginal drainage employed, nor were any cases of extrauterine pregnancy included, so that in no instance would any extraneous features be called into play. The author's conclusions are as follows: If the interval between the last menstrual period and a one-sided ovariectomy includes more than twelve or thirteen days, then the bleeding which subsequently appears may be regarded as a predisposition to a menstrual flow and usually proceeds with the loss of a less amount of blood than a normal menstrual period. If the interval between the last menstruation and the operation is less than twelve days, then the postoperative menstrual flow will be subject to delay. This circumstance may be explained by the fact that the function of the extirpated ovary must be taken up by the other side, but the delay becomes progressively lessened until the remaining ovary has completely adjusted itself to the increased function. If the ovary which contains a maturing Graafian follicle has been left behind at the time of operation, the first postoperative period will come on at the normal time and the delayed flow will only manifest itself in subsequent periods. If irregular uterine hemorrhage extending over a considerable period which is found to be due to some ovarian condition, has occurred,



this will cease immediately after extirpation of the ovary. Exudates in the stump following ovariectomy do not produce hemorrhages. After a double ovariectomy, a menstrual period may appear subsequent to the operation if the interval between the past period and the operation does not exceed thirteen or fourteen days. These conclusions seem to show that a close relation exists between the ovary and menstrual bleeding.

**Carcinoma of the Female Genitals.**—Theilhaber (*Arch. f. Gyn.*, Bd. xcvi, H. 3) believes that the statistics as to final results thus far presented by different schools of operators, do not permit us to draw conclusions which are of absolute significance. Experience seems to show that in carcinoma of the body of the uterus, the total vaginal extirpation may be regarded as the best procedure. The number of patients cured by this means is relatively large. An invasion of the parametrium usually occurs late and if the extension has once taken place, the carcinomatous process has extended so far that even an extirpation of the parametrium cannot result in a cure. Moreover, the patients are usually older women in whom extensive operative procedures, especially by the abdominal route, are very dangerous and for this reason the simpler vaginal hysterectomy is usually preferable. In cases where the carcinoma is derived from the cervical mucous membrane, it is usually necessary to remove the entire uterus with the parametria, especially if the growth starts from the upper portions of the cervix. Where the carcinoma begins in the lower segments of the cervical mucous membrane, and in which it has not extended upward, or where the parametrium remain free, the case does not, as a general thing, come under observation and treatment, because in this stage the new growth is productive of very few symptoms. Here, a partial excision, including the cervix, is as much justified as a radical operation, but if in a case of this kind, the parametria has become involved, a radical operation possibly offers a better prognosis. In a carcinoma of the vaginal portion of the cervix without evident infiltration of the parametrium, no definite conclusions as to the treatment can be arrived at. Theilhaber believes, however, that the best results attend a partial extirpation and that the good effects obtained by the older procedures with the thermocautery should not be discarded. It may be possible that the heat rays proceeding from the cautery exert a similar effect as that of the Roentgen and radium rays and that absorption of some of the neighboring carcinoma cells may occur. Theilhaber is therefore in favor of extending renewed attention to the palliative operations by means of the thermocautery.

**Leucoplakia and Kraurosis Vulvæ.**—Savare (*Ann. di. ostet. et ginec.*, May 31, 1912) publishes notes of five cases of leucoplakia and kraurosis vulvæ observed by him, with the histological examinations of specimens removed. The condition is characterized by a chronic inflammation of the epithelial strata of the derma. There is small-celled infiltration of the papillary



and subpapillary regions, which are the seat of inflammatory edema. There is a corresponding papillary hypertrophy, to which succeeds a regressive atrophy, with atrophy of the glandular papillæ, absence of the elastic tissue of the rete, and atrophy of the epidermic strata. The etiology of these lesions is not well defined. They do not predispose to cancerous degenerations of the parts affected.

**Radium Therapy of Fibromata.**—H. Cheron (*Jour. de m d. de Paris*, June 22, 1912) applies radium in the cavity of the uterus to arrest hemorrhage in cases of fibroma uteri, and with fibroids of moderate size he gets excellent results. He believes that there is a profound effect on the vascularization of the muscle of the growth, which causes hemostasis by obliteration of the vessels, but without causing gangrene of the mucosa which is often normal. He combines his internal application with external use of the ultra-penetrating rays through the abdominal walls. He uses 5 centigrams of radium, for several hours. The application may be made in the vagina when it is difficult to introduce the tube into the uterine cavity. The action of the radium should be on the whole uterus and there should not be a marked effect on the mucosa. The tube should be wrapped with several folds of gauze to remove the effect of the superficial rays, and to allow the action of the ultra-penetrating rays only. If the menopause is near, an artificial menopause may be brought on. Sitzings should last from six to twelve hours, sometimes as long as twenty-four hours. The hemorrhages are arrested permanently.

**Pathology of Ovarian Tuberculosis.**—F. Cohn (*Arch. f. Gyn.*, Bd. xcvi, H. 3) presents the results of his investigation in a series of fourteen ovaries removed for tubercular infection, as the result of which he finds in agreement with others that it is impossible to distinguish between a miliary and a cheesy form of ovarian tuberculosis, as both varieties may be present in the same ovary and merge one into the other. These cases were all operated upon for the clinically more evident tubal or peritoneal tuberculosis. Cohn claims that the superficial layers of the ovary present a resistance to the extension of a tuberculous periophoritis into the interior of the organ, which is determined to a slight degree by the behavior of the germinal epithelium, but principally by the resistance of the thickened tunica albuginea. In this way the tuberculous infection of the ovary from the surface is either entirely prevented or at least markedly inhibited. Small openings on the surface of the ovary, such as the sites of ruptured Graafian follicles, offer an opportunity for the invasion of a tubercular process from the peritoneum and it is probable that the not uncommon tuberculosis of the corpus luteum arises more frequently in this manner than in a hematogenous manner. Large unruptured follicles are not apparently affected. A tuberculous infection may also extend into the ovary from the lymph vessels by way of the hilus from a tuberculous tube. A hematogenous infection of the ovary is

probably less common than has usually been assumed. An example of this mode of infection, however, was afforded by the finding of an isolated focus in a dermoid cyst. In operating on cases of adnexal tuberculosis, the ovaries may be preserved even if tuberculous nodules are present on the surface. These must be removed, however, if a tuberculous infection of the corpora lutea is present or an extension has occurred through the hilus.

**Chemical Composition of Menstrual Fluid and Vaginal Secretions.**—A study of twelve cases by W. B. Bell (*Jour. Obst. & Gyn. Brit. Emp.*, 1912, xxi, 209) shows that the cardinal symptoms of hematocolpos are abdominal pain and dysuria, with or without retention of urine. The obstructing membrane or septum is usually the lower end of an imperforate vagina, and it may be lined on the inner surface with columnar epithelium alone or mixed with squamous epithelium. The noncoagulability of menstrual blood is due to the absence of fibrin ferment and fibrinogen, and not to mucin or lactic acid. The lactic acid found in the vagina is present in the absence of bacteria, and cannot be due, therefore, to the vaginal bacillus of Döderlein. The calcium excretion in menstrual discharge is very great, greater even than that found in urine. Urea is absent from hematocolpos fluid.

**Rupture of Pyosalpinx as a Cause of Acute Diffuse Purulent Peritonitis.**—W. M. Brickner (*Surg. Gyn. & Obst.*, 1912, xiv, 474) records an instance of this accident, of which ninety others are reported in the literature. He says that rupture into the free peritoneal cavity is an uncommon complication of pyosalpinx or tuboovarian abscess. Its occurrence is too infrequent to gain-say the conservative treatment of tubal infections. It is common enough, however, to be always borne in mind in the management of tubal suppurations, not only those of the chronic type, but also the acute cases, gonorrheal and nongonorrheal. Attacks of severe pain and fever, repeated within a short time, should suggest the possibility of impending rupture and the desirability of replacing conservative with operative treatment. The prognosis of such a rupture is increasingly grave with the lapse of time. About 90 per cent. of those operated upon within twenty-four hours have recovered. The ruptured tube should be removed at the operation, if the patient's condition does not forbid.

# DEPARTMENT OF PEDIATRICS.

## ORIGINAL COMMUNICATIONS.

### THE USE OF ADHESIVE PLASTER IN THE CURE OF TALIPES EQUINO-VARUS OF INFANTS AT BIRTH.

BY  
AMERICUS R. ALLEN, M. D.,  
Carlisle, Pa.

IN infants at birth the correction of these deformities of the foot is a simple matter and can be readily carried out and a cure effected by the physician in charge with a little care and attention.

This method has been in use by me and some of my colleagues, with modifications, during the past ten years. During this period, a sufficient number of cases have been corrected and restored to a normal condition to justify the recommendation of its use generally.

Immediately after the birth of the infant, as soon as the mother is cared for, the baby is examined and if this deformity of the foot is present, the attendant proceeds to correct the condition. The surgeon has prepared for his use a number of strips of "zinc oxide" adhesive plaster 1 inch wide and 8 to 10 inches long, conveniently placed.

The deformity is overcorrected and a strip of the adhesive plaster is placed over the sole and inner aspect of the foot, and drawn tightly along the outer aspect of the leg in a line with the outer malleolus to hold the foot in this overcorrected position. A second strip of the adhesive plaster is placed over the sole of the foot just posterior to the base of the metatarsal bones extending over the inner aspect of the foot and ending on the top of the joint of the great toe. This strip is drawn firmly and applied to the leg on the outer side, 1 to 2 1/2 in. above the external malleolus, and wrapped around the leg in an ascending spiral. This strip causes dorsal flexion, everts the foot, puts tension on

the tendo achilles, on the inner plane of the plantar fascia, and forms the hypotenuse of a triangle, the other sides of which are the leg and the part of the foot posterior to its attachment to the sole of the foot posterior to the metacarpal bones.

Strips of adhesive plaster are now placed to cover in these two tension strips, beginning on the leg 2 in. above the ankle-joint and overlapping each other, from above downward until the overlapping strips reach the instep; here they should be drawn sufficiently tight to further increase the tension on the second strip applied, until it is almost or quite drawn down upon the instep, and continued down to the base of the toes. Before it quite reaches the toes, a small fold of gauze should be placed on the sole of the foot in this region to prevent the cutting of the last few strips, which will happen if the gauze is not used. The overlapping of the adhesive plaster should consist of three or four layers applied successively, so that a firm support to the foot is maintained.

This overlapping of the two primary strips further increases the dorsal flexion of the foot, puts more tension on the tendo achilles as well as an increased eversion and tension on the inner plane of the plantar fascia.

The primary dressing is allowed to remain for ten days or two weeks, when it is removed, the foot is thoroughly cleansed with ether, bathed in alcohol and a fresh dressing applied.

If this dressing is applied immediately after birth, six or eight weeks' treatment will be sufficient to correct the deformity. Then the foot can be safely left alone with a stiff ankle infant shoe, with one strip of adhesive plaster on the outer side of the foot and leg to aid in maintaining the correction.

In those cases where the deformity is not seen for several days or a couple of weeks after birth, the ligaments will have had a chance to harden and contract and the treatment, therefore, will have to be carried out over a longer period of time.

It is surprising to note how little irritation of the skin the "zinc oxide" plaster produces when applied to young infants; in fact, in my experience it has never produced any, and has left the skin clean and smooth.

In closing, I wish to call attention to a few facts that indicate that the adhesive-plaster treatment is effective and desirable.

1. When the child is born the tissues and tendons are soft, extensible and readily yield to adjustment without force.
2. When several days or more have elapsed, the weak tendons



and tissues are overstretched and the strong ones are overcontracted, thus increasing the difficulties of replacement.

3. It is clean, easily changed, no apparatus is needed in its application, the cost is insignificant and it is always available.

4. That if used as directed, tenotomy and braces for the cure of these deformities will not be necessary.

5. That this treatment with modifications may be applied to other deformities of the foot and not alone to the one described.

6. It is much better than plaster-of-paris casts as it is not as heavy; and it remains in place until removed. By the use of successive overlaying strips it can be made as rigid as a plaster cast, and is much easier to take off.

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## DIAGNOSIS OF BONE DISEASES IN CHILDREN.

BY

GEORGE F. LITTLE, A. B., M. D.,

Pediatrist to the Kings Co. Hospital; Assistant to the Chair of Diseases of Children, and Instructor in Diseases of Children, Long Island Hospital; Visiting Physician, Children's Aid Society, Brooklyn.

DISEASES affecting the bony framework of the child, if of an acute nature, are usually discovered. If of a chronic nature, too often they pass unrecognized in the early stages. Pathological conditions should be recognized before deformity has taken place, for it is not only that portion of bone directly affected which will become deformed but other bony parts must shape themselves accordingly.

Diagnosis is not easy unless its various points are kept fully before the mind. Careful examination and the consideration of differential diagnosis are vital to early recognition.

It will not be amiss, therefore, to consider carefully the diagnosis of bone lesions and to consider their workings as they become apparent in symptoms, for "By their works ye shall know them."

*Acute Osteomyelitis.*—(Acute epiphysitis, acute purulent synovitis, pyemia of bone, acute arthritis of infants.)

The term pyemia of bone will best guide us, perhaps, in realizing the symptoms of this disease. The age is of importance for 50 per cent. of the cases occur under five years of age; the large majority of these in the first year. The onset is most often sudden with symptoms of severe systemic infection. The chart shows a high range of temperature of intermittent

type. The pulse is accelerated, the face drawn and flushed; the child is prostrated. The tongue is coated, dry and tremulous and mild delirium is not infrequent. Locally there is usually pain of a throbbing nature, involving one or several joints with tenderness and perhaps redness. Soon there is swelling. There may be pitting of the skin on pressure, and a little later fluctuation may be recognized.

In another group of cases the onset of the disease is less acute with a low range of fever and slower development of the sequence of symptoms, suppuration not being apparent for ten days to three weeks.

It is to be remembered that in young infants the cause of the constitutional symptoms may not be clear at first, but it is often noted that the child cries out when disturbed and that an extremity, usually a leg, is not moved.

The inflammation commences most frequently at the epiphysis or in the medullary canal of a long bone. The femur, tibia and humerus are oftenest involved in the order written. The process extends quickly, involving the hip, knee or shoulder. The ankle, elbow, maxillæ and small joints are other points of election.

*Differential Diagnosis.*—As to differential diagnosis, rheumatism is not frequent under five years; is extremely rare in infancy. Scurvy shows inflammation of the gums and usually ecchymosis on the body surface. Anterior poliomyelitis has an acute onset with loss of function in a limb but no localized pain, tenderness or swelling. Traumatism gives a history or shows signs. Syphilitic epiphysis has resemblance in disability and localized tenderness, but acute onset, marked constitutional symptoms and rapid swelling are not found, nor are these signs present in tubercular joint affections. Typhoid fever has been mistaken for the more protracted form of osteomyelitis, yet careful examination reveals the joint involvement in the latter. The leukocyte count is high in osteomyelitis, low in typhoid; the Widal reaction is present only in typhoid fever.

*Syphilitic Diseases of Bone.*—Parrot's disease (called by Parrot, syphilitic pseudoparalyses of the new-born); epiphyseal osteochondritis, acute epiphysitis.

This is the common form of specific bone lesion in infants who enter the world handicapped by "the sins of the fathers." The symptoms usually appear early, within the first two months of life—the starting-point may be intrauterine.

The long bones, especially of the upper extremities, are those usually affected—the humerus, radius or ulna.

The child is not infrequently brought to the physician because of loss of function in the affected member and paralysis is suspected unless a history is obtained and a full examination made, both as to the affected part and for other specific symptoms. If the lesion be, as it occasionally is, the first sign of syphilis diagnosis will be more difficult. Locally there is at first tenderness and then swelling at the junction of the epiphysis and diaphysis. This tumor is usually not of marked degree and is globular or cylindrical in form. While in many cases these lesions are unilateral yet in a good proportion both sides are affected symmetrically, in the latter event a diagnostic point is already made.

*Differential Diagnosis.*—The epiphyses are often much enlarged in rachitis and there is tenderness, but this is general, not localized in a joint or two, and there will be other marked evidences of the rachitic condition. Rickets is most common between six months and two years, while syphilitic epiphysitis occurs in the first few months of life. Birth paralysis presents no epiphyseal swelling, no pain or tenderness. Tuberculous disease of bone is infrequent in infancy. Acute osteomyelitis may be ruled out from the location of the swelling and the temperature curve. Should there be suppuration, however, and invasion of a neighboring joint, exclusion of osteomyelitis will be more difficult. The results of specific treatment are of value in general differential diagnosis where the condition allows the necessary time.

*Chronic Osteoperiostitis.*—This is the usual bone manifestation in the hereditary syphilis of older children, appearing most often after the sixth year and rarely before the third. This form of disease has a predilection for the tibia, cranium, radius and ulna. The periosteal inflammation leads gradually to an extensive thickening of the bone, irregular or uniform. This hyperplasia gives rise to important diagnostic features, *i.e.*, the sabre deformity of the tibia and bony elevations or nodes upon the cranial surface. These changes if present show in the case of the tibia a convexity of its anterior aspect. The nodes on the cranium are an inch or more in diameter and are elevated perhaps a quarter of an inch or less. The tibia may be irregularly affected, there being large nodes instead of the forward curve.

The pain and tenderness in these cases come on very gradually;

the deformity may be noticed first. Pain is always less during the day or may be absent; it is worse at night—a notable diagnostic symptom.

*Dactylitis*.—This affection is not common. It may appear in syphilis tarda or late hereditary syphilis, but if it manifests itself it is usually in young children. The phalanges, the metacarpal and metatarsal bones are the common seats of the disease. Of these bones one or more are markedly enlarged. The lesions may be symmetrical. After a time there is likely to be a breaking down from abscess formation. The disease is probably a syphilitic osteomyelitis in most cases, in others a syphilitis periostitis. Differentiation from tuberculosis dactylitis (*q. v.*) may not be easy.

*Tuberculous Diseases of Bone*.—This subject presents a great complexity of symptoms and its consideration must be limited to the more frequent regional manifestations. In comparing this group to that preceding the following differential points given by Morrow are of value. These are in condensed form. 1. Syphilis has marked predilection for long bones, almost always at the terminal extremity of the diaphysis. Tuberculosis affects the epiphysis almost exclusively, rarely the shaft. In syphilis there is marked enlargement of the bone, little or none of the soft parts—in tuberculosis there is edematous infiltration of the soft structures. 3. In syphilis there is little tendency to suppuration and necrosis, in tuberculosis the pyogenic tendency is marked. 4. In syphilis there is a marked tendency to aching pains in the bones with nocturnal exacerbations; in tuberculosis dull heavy pains, not aggravated at night, sometimes entire absence of acute pain. 5. Osseous lesions of syphilis rarely react on the general system, those of tuberculosis often determine marked impairment of general health.

*Tuberculous Ostitis of the Spine*.—(Pott's disease, caries of the spine, spondylitis, vertebral ostitis, angular curvature of the spine, spondylarthrocace.)

Justice cannot be done to the diagnosis of this form of disease within the necessary confines of the present paper.

*General Symptoms*.—Muscular rigidity is present always in the early stages leading to peculiarities of attitude and gait. Pain is rarely absent, usually dull, intermittent, deep seated, experienced usually at peripheral distribution of the irritated nerves above or below lesion.

The deformity, a posterior angular curvature, is noted more easily where the spine curves forward (dorsal region).



Abscess when present in a looked for locality is confirmatory. Fifty per cent. of the cases are from three to five years of age. The location of the lesion is dorsal in about 60 per cent.; lumbar in 3 per cent. and cervical in 1 per cent. of the cases.

*Special Symptoms.*—*Cervical region:* Wry-neck with neuralgia in the occipital region is common. Pains at the front or side of the neck; or distressed breathing at night may occur. If the head is moved to the normal position the whole body turns with it. The patient moves the body in attempting to look to the side. The head may be extended or sharply flexed. It is common to see the head supported by the hands of the child. A definite deformity is not usual but is frequently absent; there may be a flattening of the back of the neck. When an abscess is formed it usually presents posterior to the sternocleidomastoid muscle, at the posterior wall of the pharynx, or more rarely in the mediastinum.

*Dorsal Region.*—In cervicodorsal disease, the shoulders are drawn up, the chin elevated and the neck pushed forward. The spine below the lesion may show lordosis. In dorsal disease proper the shoulders are held high and squarely, the patient walks with an erect military gait. Angular deformity when it occurs is well marked, the spine curves forward above and below the seat of the caries. There is usually a lateral deviation of the spine. Abscess may appear at the back or side or may gravitate downward and show as a psoas abscess. There may be the so-called breath catch, and occasional short muffled sound partly resembling a cough. This disappears on lying down. The patient has a tendency to rest the hands on the hips, or if sitting to lean forward resting the hands upon the thighs or sometimes resting them on each side of the chair. The pain in dorsal involvement is usually referred to the abdomen, or to the intercostal nerves.

*Lumbar Disease.*—There is general lordosis apparent in the increased hollowness of the back and the attitude of overerectness. The child walks in a peculiarly careful fashion to avoid the jar of striking on the heels; the gait is comparable to a swagger or waddle. Where there is marked psoas contraction from abscess the patient bends forward and limps; the hand often rests on the knee. The lumbar section of the spine straightens as the disease progresses and may finally project backward in angular deformity. If there is suppuration the pus appears as a psoas, lumbar, iliac

or gluteal abscess. Pain in this form of disease is referred to the thigh, groin or buttock, sometimes to the hypogastrium.

In examining for suspected spinal caries the details as to manner of onset, duration of symptoms, location of pain, family history of tuberculosis, etc., are to be carefully obtained. The child is then stripped and required to stand, sit and walk and peculiarities of carriage, attitude and gait are noted. The contour of the spine is inspected from a lateral point of view and also from behind, the patient standing in a good light. The flexibility of the spine may be tested in several ways. The child is required to pick up a coin. Is this done by the natural bending forward of the spine, or is the spine held rigid and the coin obtained by squatting? If the patient is placed prone upon the floor does he rise naturally or "climb up upon himself" with the assistance of the hands upon the thighs or does he crawl to the nearest chair or other supporting object and drag himself up with the help of the arms? Restriction in flexion is well tested by placing the child on his hands and knees and lifting him from the floor, the operator standing at the side with his hands underneath the body. Extension is tested by placing the patient prone upon a table, face down. Both feet are grasped with one of the operator's hands, the other fixes the cervical region to the table by pressure, the feet and with them the legs and body are lifted to a moderately high point; the spine should curve freely down to the point of fixation. In testing the lumbar spine especially the thoracic region should be fixed. Psoas contraction may be noted with the child in the same position. Fix the pelvis firmly to the table and grasping a foot, raise first one leg and then the other; do both legs extend equally? Do the knees rise several inches from the table? As a confirmatory test, turn the child upon the back and bring the hips to the edge of the table; the limbs drop downward; do they drop equally or does one remain more flexed than the other? A slight bilateral restriction of extension is not uncommon—a marked unilateral restriction usually means abscess.

Examine for abscess (demonstrable in 50 per cent. of lumbar cases) by palpation in groin and iliac fossa with the thigh flexed. A rounded tumor may be found in the fossa or an elongated mass nearer the spine. This procedure should be carried out even if no psoas contraction be present. According to the apparent location of the spinal caries examine for abscess in other regions as mentioned.

*Differential Diagnosis.*—There are a score of conditions which may resemble tuberculous disease of the spine in some few points. It is not possible to enter upon the matter within the limits of this paper. Careful and intelligent examination should make the case clear.

*Tubercular Ostitis of the Hip-joint.*—(Morbus coxarius, morbus coxæ, coxitis, coxalgia, chronic articular ostitis of the hip.) This affection is not frequent after the thirteenth or fourteenth year. Half the cases occur between the ages of two and five. It commences usually as a chronic ostitis near the head of the femur. The onset is very gradual, the affected limb being easily tired. There is sensitiveness at first about the joint, then pain and swelling. Pain is characteristically referred to the knee, it is not constant and may be entirely absent. The patient limps, but not constantly at first. He walks on the ball of the foot with the knee and hip a trifle flexed. There is limitation of motion at the joint with early atrophy of the muscles. To the flexion is added abduction and outward rotation and with the progress of the disease shortening of the limb. Sharp night cries are significant. They occur early in the course of the disease and usually in the early part of the night.

*Differential Diagnosis.*—The affection is most likely to be confused with lumbar Pott's disease where psoas contraction exists. In the latter, motion is restricted mainly in extension. There are no remissions in lameness, the patient can stand well on the lame leg, there is usually lordosis. Pain and stiffness are present in the morning and pass away during the day; in hip disease this is reversed.

*Traumatic Inflammations of Bone.*—Blows, falls or other violence may cause inflammation of the periosteum and directly or indirectly of the bone itself. This is especially true of bony surfaces that are thinly covered by soft parts. The history of injury with local evidences of traumatism will aid in our diagnosis.

## TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

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*(Meeting of May 9th Concluded.)*

### CHRONIC COLITIS IN CHILD THREE YEARS OF AGE WITH DEFORMITY AND THE DEVIATION OF SIGMOID.

DR. J. FINLEY BELL reported this case. He said that the child came under his care on June 2, 1909, when he was four months of age. He had been nursed for six weeks, then fed on mixed feeding for two weeks, and finally on modified milk, prepared according to the formulæ found in Dr. Holt's small book. The child had never had a normal movement of the bowels up to the time Dr. Bell saw him. The stools were green and contained curds. At the age of three months the child had nearly doubled his weight at birth, 6  $\frac{1}{4}$  pounds, but after an attack of influenza he lost. At the time that he came under Dr. Bell's care he was dull, and apathetic at times. This apathy amounted to stupor. He cried out occasionally as though in pain. His head was boxy and there was a beginning rosary. After several trials a modified milk with fat percentage under two and one-half, and not exceeding 18 grams a day was found to agree best with him. He gradually improved until early in August when he had a sharp attack of diarrhea, with stools containing large amounts of mucus. There was a slight return of the stupor and the temperature remained subnormal throughout the attack. In the latter part of August he had another attack, during which the temperature went up to 40° C. and he had considerable pain and tenesmus. As this attack occurred before he had returned to a milk diet it was rather hard to account for it. Irrigations were tried but were only occasionally successful. The child was put on whey and later on whey top milk mixture and did fairly well though an edema developed which lasted for more than a week. Later he was put on goat's milk and from that time improved until the supply of goat's milk became insufficient. During the winter and spring, observations showed that when eggs were given even in small quantities edema and urticaria resulted. Starches such as potatoes and most cereals increased the size of the stools which were already abnormally large. The attacks of colitis recurred, becoming more and more frequent and more continuous. These attacks were characterized by large copious stools out of all proportion to the amount and character of the food taken; constipation, alternating with diarrhea; localized pain or discomfort, vesical irritability and urgency and the development of a marked precosity along neurasthenic lines. From the



spring of 1910 the attacks became more frequent and continued so for a year. In April, 1911, he had a very severe attack and from that time the exacerbations became more frequent than before. The urine was found to be alkaline and contained leukocytes, triple phosphates, urates of soda and ammonium. He was put on saccharine, benzoate of soda, and urotropin. The treatment was continued until the fall of 1911 when the child was sent to Dr. Le Wald for x-ray examination for a possible urinary calculus. This being negative it was decided to make a number of x-ray plates under a bismuth meal and injection. The history of this case taken in connection with the x-ray findings presented a number of interesting questions involving the etiology, symptomatology and diagnosis, and the treatment. The questions that came up regarding the etiology were: 1. Were all these cases of chronic colitis due to deformity or deviation of some portion of the colon? 2. Were such deformities and deviations always congenital or might they not result from acute attacks of colitis of bacterial origin, the deformity having been produced by severe tenesmus, or excessive irrigation? 3. Inasmuch as many of the cases of colitis in adults had been shown by x-ray examination to have marked deformity and deviation of the colon, some of which had been improved and some cured by surgical measures; whether or not these cases had been congenital, and if so, to what extent were symptoms of the condition present during childhood? As to methods of diagnosis, formerly these were along bacteriological lines and gave no enduring results. The successful use of the bismuth test meal and enema, with x-ray photography was eminently successful in this child of three years, hence Dr. Bell felt firmly convinced that in all cases of chronic digestive disturbance in children this procedure should never be omitted from the examination. In regard to treatment, the points of interest presented were hygienic, medical and surgical. As the deformity and deviation could not be corrected by medical measures, success along these lines depended on the ability of the deformed intestine to functionate normally after the mucous surfaces had been treated medicinally. If improvement followed such treatment, would it be lasting? These conditions in any case should be considered and watched by the pediatrician and surgeon, in order that treatment might be prompt, correct and adequate. A new field in pediatric surgery might be opened as a result of this refinement in diagnosis. In this case for instance dietetic and medicinal measures had been tried faithfully and without avail. Irrigations had to be continued daily and this constant use so impressed the little patient that he talked of little else and was fast becoming a confirmed juvenile neurasthenic.

DR. JOSEPH E. WINTERS.—The colitis occurred when this baby was nine months old. The infant was placed on goat's milk and very quickly there was a marked improvement in its

condition. Speaking from his own experience and from his observation of cases on the use of goat's milk Dr. Winters did not believe that anything better could have been devised for this case. He had had three particular experiences with goat's milk, and these cases commended the milk to him. All three patients were rescued by its use. In such cases, with the appalling death rate that occurred during the summer weather, goat's milk, whenever available, gave most valuable results. After the age of one year it had been his experience that the cause of the appearance of mucus in the stools was milk and irrigations. The long continued use of irrigations at any period of life would cause the persistence of mucus in the stools. The sigmoid was long in children and was very likely to become misplaced. Any child that had a colitis, with mucus in the stools, would do well if fed on nothing but cereals with butter and salt. He cautioned against the use of broths, milk and eggs; and advised giving these patients only dry cereals. Irrigations should be entirely excluded from the treatment of these cases. One of the things which aroused his anxiety in regard to irrigations was the remark of Dr. Dickinson who stated that he thought paralysis of the intestine resulted from the long continued use of irrigations. As Dr. Dickinson stated, there was an intestinal paralysis, or a chronic "ballooning" resulting from the long continued use of these irrigations.

DR. WINTERS recalled the results of the dry cereal treatment employed on a child who had been brought to him from Philadelphia; the colitis had existed from April, 1908, to October, 1909. Within six weeks the child went home well and had been given nothing but dry cereals. Two children with the same condition were brought to him from Brooklyn, and in one mucus had appeared in the stools for six years. These children recovered in a few weeks and the only treatment used was the dry cereals. Another patient was brought to him from Panama under the care of a trained nurse; within two months the patient was sent back well. Dr. Winters believed that every case of colitis occurring in children of one year, or at any age after this, with no other treatment except the use of cereals with butter and salt, with no irrigations, would get well in every instance, and in a surprisingly short period.

DR. HENRY W. BERG said he had hoped to hear some surgical opinions concerning the handling of these cases of chronic colitis with deformity and deviation of the sigmoid flexure. The pictures presented demonstrated to him, however, one very important thing, namely, that the bismuth meal used, bringing out the outline of the stomach and intestines, under the x-ray was going to be a great source of advantage in diagnosis. He did not know of anything which threw more light upon this type of case than injection, from below, of the colon and rectal tract with bismuth emulsion preceding the taking of the x-ray picture. It should be remembered at the same time that there is a source

of error in this procedure, and that is the relative position of the patient. The picture showed an extraordinary large sigmoid for a child of that age; nevertheless there was no question but that the sigmoid flexure as demonstrated had the large number of convolutions shown. It would be interesting if some one would publish a series of x-ray pictures of children from one to four years of age in which would be compared the normal with the abnormal. Before one should attempt to translate pictures of the kind presented we should be able to distinguish the normal and the abnormal and especially in those cases without any symptomatology. Sufficient knowledge has not been acquired to enable us to diagnosticate positively the degree of abnormality in a sigmoid as represented in the pictures presented and to say that it really is as pathological as it appears. Dr. Berg thought a sigmoid of that kind, even if it was as pathological as it looked, or as abnormal as it looked, was an exceptional sigmoid and one that possibly required some surgical procedure to shorten its length. He said he could not conceive any method of therapy, or feeding, which would overcome such an obstruction as that appeared to be. They all knew that rachitic children had extraordinarily large sigmoid flexures as compared with the size of the pelvis; the pelvis in these children were as a rule very shallow. The increase in the size of the spinal column was so much greater than the increase in the length of the intestinal tract, there was such a disproportion in growth that one could readily see that, if the conditions present were not pathological, they might become absolutely normal in a growing child in the seventh, eighth or ninth year. If one should temporize then either by some surgical procedure, or by irrigations, or feeding, the child were tided over two, three or four years, there would be hope that as the body grew this disproportion of the intestinal tract might be overcome and normal function occur as in the normal bowel.

DR. BERG believed that of greater importance, however, was the diagnosis. Could they make a diagnosis, a probable diagnosis even of this condition by means of the x-ray pictures? As a rule, he thought they could. In many cases a cause of constipation was the increase in the length of the sigmoid itself; also, on account of this fact, the sigmoid flexure being so long, there was not sufficient muscular power to send the stools through the sigmoid to produce a passage at all. This was a clue to the treatment. There was too much irrigations of the bowel being done in these cases, yet the child's bowels should have a thorough cleaning out, especially of the sigmoid flexure and the rectum, every day. Cathartics would not do it. Dr. Berg said that he had found in many of these children with long sigmoid flexures, those who strained so hard at stools in their efforts to push their stools along, that good results followed the use of enemas of soap suds with the addition of plenty of nonirritating oil; the less irritating the oil the better and there should be lots of it. He preferred first sweet oil and then castor oil. The cause of many



of these cases of mucus colitis was a hypertrophy of the coats of the transverse and ascending colon; there was as well a hypertrophy of the mucous membrane and this acted as an accessory in producing the vast amount of mucus which appeared in the stools. If they could keep the sigmoid clear of stools they would in all probability be able to cure their patients. Any surgical measure employed would have in view the shortening of the length of the descending colon and sigmoid flexure, really the only practical operation in such cases.

DR. SARA WELT-KAKELS considered the reported case a very interesting one on account of the coexistence of chronic colitis and marked displacement of the intestine. She did not consider it likely that there was an interdependence between the latter and the colon irrigations ordered by Dr. Bell. On the other hand, the anomalous position of the large intestine might be an etiological factor in the production of the colitis. It was a well known fact, pointed out many years ago by Dr. A. Jacobi, that the descending colon and the sigmoid flexure were very long in infants; the sigmoid had multile plexures; this and the long mesocolon permitted it to drop into the shallow infantile pelvis. This would easily result in an undue accumulation and stagnation of feces, the production of a faulty circulation and colitis. These conditions did not remain permanently, as about the sixth or seventh year the different parts of the intestine assumed a more normal position. With regard to the *x-ray* picture she suggested to Dr. Bell the rectal use of the gastrodiaephane to learn if he could reach the place supposed to be the sigmoid flexure.

DR. JOHN DOUGLAS said that the previous speakers had referred to the length of the sigmoid flexure and the relatively longer mesosigmoid in children. But there was another point which should be born in mind as an etiological factor, the general musculature of the lower portion of the intestinal canal, and especially of the sigmoid flexure and the rectum, was deficient in tonus as compared with the rest of the intestinal tract in infants. From a medical point of view there was in this case a colitis; from a surgical point of view this was a case of partial volvulus. It had been questioned by a previous speaker, was the trouble entirely within the sigmoid flexure? There was no question regarding the diagnosis as what was present was shown by the stereoscopic picture. Whether the malposition was an etiological factor of the chronic colitis or not, or whether the colitis was an etiological factor in the production of the malposition, Dr. Douglas did not believe it was possible to say; however, one might be dependent upon the other, a sort of vicious circle.

With regard to the treatment, the bismuth *x-ray* was a wonderful aid not only in the making of diagnoses but in indicating the treatment as well. Sometimes plates showed malpositions in patients that presented no symptoms. Dr. Clark of Philadelphia had shown bismuth *x-ray* plates of abdominal conditions



and in one, a very interesting plate, showed the sigmoid in the position supposed to be occupied by the descending colon. In a large number of instances in children the sigmoid flexure was found extending over to the right side of the abdomen due to the long mesosigmoid. In these cases of malposition, many of them he thought could be cured if they could be tided over, as already suggested, until a time when this marked disproportion between the length of the sigmoid and the rest of the intestinal tract could be corrected. Under proper diet there should result an increase in the musculature of these children, not only of the the sigmoid but of the intestinal tract throughout. In nearly all of these cases no surgical treatment was necessary. Those cases, however, which could not be cured by medical means, and especially when the patients were losing ground, should have recourse to surgical interference. If one of these cases were getting worse, and the child were in danger, then it should have surgical aid. The operation was not necessarily a dangerous one. In operation there were two things that should be taken into consideration: first, suspension of the sigmoid (a sigmoidopexy) and secondly a resection of the sigmoid. If by a sigmoidopexy correction of the volvulus or malposition was possible there then would be no question of any resection of the intestine for the cure of this condition. In Dr. Bell's case a sigmoidopexy might be possible and a resection avoided. The former operation might be done without much danger. If unsuccessful then the more dangerous operation could be resorted to. At the same time Dr. Douglas did not advise any operation until medical treatment failed to relieve these patients; then the time arrived to resort to surgical measures.

DR. HENRY HEIMAN said that almost forty years ago Dr. A. Jacobi called attention to these conditions, but it had been only recently that more attention had been paid to them by others. In 1886 there had been described another condition which should not be confused with the condition described by Dr. Jacobi. Among the older children there occurred an hypertrophy with dilatation of the intestinal tract, especially of the colon, and this caused a mucous colitis and constipation. The two types of cases should be separated clinically. One type of cases would always make a good recovery; this type would adjust itself; as the pelvis grew the descending colon would assume its normal size. Whereas, on the other hand, in Hirschsprung's disease, with hypertrophy and dilatation of the lower portion of the colon, these patients might come to operation.

DR. HEIMAN said he would not recommend in a case like Dr. Bell's the employment of soap; it irritated the delicate mucous membrane. He thought it would be better to use the physiological salt solution because the treatment should be used for months and months. If the child was not gaining under medical treatment, then recourse should be had to surgical intervention.

DR. ALEXIS V. MOSCHCOWITZ acknowledged that he had an untrained eye in these cases but the patient presented by Dr. Bell did not look to him as being very sick; he thought the baby a very healthy looking one. The symptomatology, as described by Dr. Bell, pointed to a colitis. The use of the x-ray discovered a fair sized sigmoid flexure and he had seen sigmoid flexures in unborn babies just as large; in fact, he said he had seen sigmoid flexures that occupied the entire abdomen. He granted that the sigmoid flexure in Dr. Bell's patient was a good sized one. He did not believe that anything should be done at present from a surgical point of view, although a sigmoidopexy might do good. However, if anything in the surgical line was required they should resect the sigmoid and do an end to end anastomosis; this was a rather formidable operation upon anybody, and particularly upon an infant of three years. He thought the child was going to make a good recovery without resorting to operative interference.

DR. J. FINLEY BELL, closing the discussion, said that in the case reported not more than one-half dozen irrigations had been given during the acute attack of August and September, 1909, and that in most of the attempts it was difficult to get the tube in the rectum more than six inches.

A point which had been made in the paper, but which had not been considered by the debaters was the question of vesical irritation which is and had been throughout a prominent symptom in the case.

He recalled seeing a case Monday night which was operated by Dr. Douglas, at St. Lukes Hospital, of a large abscess in the mesentery corresponding to the sigmoid probably the result of suppurative diverticulitis, this abscess mass being directly back of the bladder was probably responsible for the bladder irritation which was present during the entire history of the case. Therefore I am inclined to believe that the accumulation of feces corresponding to the distorted and dilated sigmoid in this child causes the bladder irritation, which always improves on a successful emptying of the gut.

True this child does not appear very sick. His nutrition seems fair, but he is rapidly becoming a neurasthenic continually talking of the pains in his abdomen and talking to his toys and playthings regarding the irrigations which have been used frequently during the past month.

Replying to Dr. Moschcowitz upon the apparent relative enlargement of the sigmoid, he said that it was not alone the dilatation of the sigmoid, but the distortion which was in the form of a "pig-tail" curve rather short, and that the decided enlargement corresponded to this curve. It is probable that this portion of the sigmoid is the seat of production of large amounts of mucus which appear constantly in the stools.

In regard to Dr. Jacobi's theory which has been referred to that the elongation of the descending colon is taken up by growth

of the child, he said that the elimination of such a deformity could scarcely be expected by such process and might easily complicate the condition. Likewise the result from a sigmoidoplexy might be somewhat in doubt.

From the statements of the members, medical and surgical who had discussed the paper it was quite evident that we should have to depend on such remedial measures as were from time to time offered until the case further progressed, or until more cases of similar character were under like observation.

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## AMERICAN MEDICAL ASSOCIATION.

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### SECTION ON PEDIATRICS.

#### *Afternoon Session, June 5.*

*Allergy to Common Foods. Idiosyncrasy to Hens' Eggs.*—DR. OSCAR M. SCHLOSS of New York said that the idiosyncrasy of certain individuals to eggs had been recognized for a long time, but he had found the condition far more common than was usually supposed. The symptoms caused in susceptible individuals by the ingestion of eggs were first gastrointestinal, second cutaneous and, third general. He had found the symptoms combined in most cases. He had been able to bring about the anaphylactic state in animals by the injection of blood or serum from an affected patient. The condition is at times inherited, as other members of the family often showed the same idiosyncrasy, and in animals the young of a sensitized mother were effected with the same condition. In some of his cases the merest trace of egg brought about severe symptoms. He had been able, however, to overcome it by the giving of very small quantities, gradually increased until the patient was able to eat egg in any quantity. He used the active protein of egg-white in pill form, beginning with 1-1000 and gradually increasing over a long period, with good results. There seemed to be no adequate explanation of the hypersusceptibility of some individuals.

DR. MILLER of Atlantic City said that his daughter had this idiosyncrasy but only manifest against the yoke. It had been gradually overcome by the persistent feeding of small quantities. He thought the condition one of poisoning brought about by certain pus conditions because many of the symptoms were those of ptomaine poisoning.

DR. DENNY of Brookline, Mass., reported a case in which there was reaction from local application of egg to the skin. A child of two years, he said, was made violently ill after taking a small



quantity of egg. About a year later its mother was washing its hair with a shampoo made largely of beaten egg and almost immediately there was congestion of the scalp and elevated condition of the skin everywhere that it had been touched by the mixture. He said that it passed off quickly, but there was no question but that it was caused by the egg. The child had since been fed small quantities of egg until the idiosyncrasy disappeared.

DR. ZAHORSKY of St. Louis had a patient which showed rapid swelling of the lips as soon as the egg touched them, and he had since used that as a diagnostic measure, but in as much as Dr. Schloss had found not all cases of idiosyncrasy showed the cutaneous symptoms, he doubted its accuracy at all times.

DR. DOUGLAS of Detroit agreed with the speaker that the condition was quite common. He said that in many instances where one attempted to alternate a milk diet with egg he would find this complication. He thought that the idiosyncrasy might be explained through some error in the digestive functions.

DR. RICH of Detroit had noticed similar anaphylaxis in mother's milk. During the winter he had seen a case of an infant five days old presenting this clinical picture, apparently caused by the ingestion of mother's milk. He put it on barley water a day or two, then back onto the breast and the symptoms reappeared. It was finally weaned entirely and fed upon cow's milk.

DR. ABT of Chicago directed attention to the violence of the reaction. He said that he had seen children suffer intensely and be almost entirely covered with the edematous swelling. He had also had asthmatic symptoms present. He thought that this idiosyncrasy was not usually connected with the symptoms presenting and that if the cause was discovered it was in an indirect way.

DR. SCHLOSS in closing said that Dr. Miller's case was the only one he had knowledge of in which the yoke caused the symptoms. He could give no explanation of the variation in the symptoms. He had found the cutaneous symptom the most constant and usually the first to present, and sometimes evidenced upon taking the slightest quantity of egg used in the preparation of other foods. He could offer no explanation of the case which presented these symptoms from taking mother's milk. He said that it had been explained upon the anaphylaxis basis, but was a subject upon which no work had been done.

*Tabes Mesenterica in Infants and Young Children.*—DR. FRITZ B. TABLOT (Boston) before presenting this paper wished the title changed to "Tuberculosis of the Mesenteric Glands in Infants." He reviewed first the manner in which food stuffs are absorbed into the system, showing the effect upon the digestion. He believed that tuberculosis in early life was chiefly of the glands. In one case in his hospital (instanced because its symptoms were typical) laparotomy showed a small amount



of pus in the abdomen and nodules about the size of marbles in the mesentery. He said that the mesenteric glands are so intimately connected with digestion that when they become diseased it was possible for them to disturb the entire digestive process. If a sufficient number became diseased they formed a barrier through which the fat could not pass, being dammed back into the intestinal canal, and it appeared in the stool. He said that when large amounts of fat were taken in the food a secondary intestinal indigestion might result, while if it was removed the clinical conditions of the child improved; therefore, the need for carefully regulated diet and in all instances where the disease had progressed far enough to check the lymphatic system, the elimination of fat giving carbohydrates in their place.

DR. DENNETT of New York wished to know if postmortem examinations had revealed any lesions in the chest.

DR. JOHNSTON of Grand Rapids thought it premature to say that a block had occurred because fat appeared in the stool. He said that in most conditions where the intestines were involved the fat metabolism was below par, but just how far he was not prepared to say. He thought there was no doubt but that in infections where the liver was involved the absorption of fats would be poor, so in view of that he would hardly think it wise to argue backward that because there was poor fat metabolism there was involvement of the lymphatics.

DR. PISEK of New York thought that frequently where fats were eliminated in the stool the child was suffering from malnutrition, and a regulation of the amount taken would eliminate it from the stool.

In closing the discussion DR. TALBOT said (in answer to Dr. Dennett) that the autopsy in these cases had been very interesting. One case, presented unmistakable tuberculosis of the mesenteric glands and a normal lung. He had reviewed the literature of this condition and found it common in pulmonary tuberculosis for other parts of the body to be involved. He said that this elimination of fats was not a piece of metabolism work but a purely clinical observation coming in routine hospital service. He said that in their examinations they had not seen the fat come through in conditions of chronic digestive disturbance, but had found it almost universally in cases of jaundice where the bile was collected in the intestinal canal and would expect to find it in the majority of instances of tuberculous peritonitis. He cautioned against the tendency in some communities to feed cod liver oil and olive oil to children with tuberculosis, saying that this aggravated the symptoms.

*The Caloric Requirements of Bottle-fed Infants.*—DR. ROGER H. DENNETT of New York read this paper presenting a method of estimating the caloric requirements by ascertaining the minimum number of calories on which a baby would gain in weight. He showed tabulated feeding records of the three classes of babies—normal, atrophic and very fat—and the maximum and minimum

averages in twenty cases followed over a prolonged period. He thought that the percentage designation of feeding was misleading, but when the doctor thought in measures of calories and modified the food to the digestive ability of the infant he would get good gain in weight without overfeeding and consequent digestive disturbance. His series was taken from babies in intelligent homes, so as to get average home conditions. He examined stools continuously and unless they were normal and there was no vomiting he did not consider the food correctly balanced. He found that an atrophic infant required a higher caloric value per kilo of body weight than a normal child, and could take it without digestive disturbance.

DR. PISEK of New York thought that the caloric method of estimating foods should be used merely as a check, that the gain in weight was the criterion to go by. He said that any aid to telling what a baby was getting, and could take care of, should be used, but to confine one's self to either caloric or percentage estimating alone was a mistake.

DR. TALBOT of Boston thought that no charts of this sort could be accurate as he had found by repeated examinations that the milk from various herds of cows would vary as much as 25 per cent., so that accurate estimates of what a baby was getting could not be made. He used percentages as well as calories and fed each individual baby according to its needs.

DR. DOUGLAS of Detroit thought that these findings were not applicable to the class of babies that had been damaged by feeding. He said that he had been in the habit of telling mothers that until they could feed their babies so many ounces of food to so many pounds of body weight without digestive disturbance they could not gain.

DR. MORSE of Boston said that until the food was fitted to the digestive ability of the individual baby no method of estimating food values was of much assistance. He had found that the average baby in the first year consumed between 100 and 120 calories and that when they could not take that amount their gain would not be satisfactory, although they could just about maintain an even weight on 70 calories.

DR. CHAPIN of New York said that the main objection to caloric estimates was that they overlooked the main object of feeding—growth. For that reason he considered it not as a guide, but as a check. He said that it was not the heat and energy producing qualities of food that was the estimate of its suitability to a baby's needs, but whether the baby grew on the diet.

DR. DENNETT in closing said that he had not intended to imply that this was the only method to be used, but desired to call attention to the desirability of estimating the caloric value of foods, as well as their percentages. He said that to successfully feed infants one must not neglect one single formula, or one estimate of food values that had been of value in some cases. He thought that the differences in the food value of various samples

of cow's milk would be small when its mixture with other ingredients was considered. He said that he had started to figure that out but found it to be about 5-10 of 1 per cent. in a single feeding, so that he did not consider that it influenced the final count much. He said that in his chart he had shown one baby that was distinctly "damaged by feeding," weighing 6 pounds at two and one-half months of age, and it showed a nice gain under his method of feeding.

*The Relation of the Infant Welfare Movement to Pediatrics.*—DR. THOMAS B. COOLEY of Detroit said that in this era of preventive medicine pediatricists should not be slow to urge the importance of the infant welfare movement and to have a guiding hand in its management. He thought that no one thing would tend to lessen infant mortality more than the education of mothers in prophylaxis, and the instruction of midwives. But he pointed to the danger of the work going ahead so rapidly that it would get into lay hands before a firm foundation had been established. He said that it was naturally the province of the boards of health, but that before it could go into their hands the pediatricists should lay down the methods of teaching baby feeding on a large scale, the possibilities of breast-feeding, etc. He thought that the future of this work lay with the pediatricists and should not be relegated to nurses or unskilled enthusiasts who might hinder rather than help its progress. He thought that the pediatricist should not be slow to grasp the opportunities offered in this work—the possibility of gathering statistics, of working up private practice and adding definiteness to many of the theories now held. He thought that the entire movement was but a new and broader scope of the pediatric field and lamented the fact that so far there had been no close affiliation with any association of pediatricists and no evident connection between two movements which should be inseparable.

DR. DOUGLAS of Detroit thought the pediatricist the only one capable of directing the public upon so important a matter along lines that would be true and scientific and would not need to be reversed in two or three years.

DR. PISEK of New York said that he had been actively connected with the campaign in New York and while he thought the boards of health the logical place for the carrying on of such work, did not think it wise to have it placed there until its details had been mapped out by the pediatricist along right lines. He thought that at present private philanthropy directed along the lines laid down in Dr. Cooley's paper was the proper method to pursue. From his experience in New York he believed that a careful canvas of large cities should be made, mapping them out into districts, each receiving an appropriation from the health boards and then put in charge of pediatricists who would carry along the work on a high plane. He thought that to attempt to do infant welfare work in cities upon a small scale would do more harm than good because unless really large



results could be shown at the end of the year public interest would flag.

DR. HILL of Philadelphia called attention to the so-called "Baby Saving" shows, under the direction of pediatricists, going on during June in their city. He said that the interest of the poor classes, and young women, in their exhibits was remarkable and very encouraging. He said that their city council which had previously refused an appropriation to the carrying on of the work was reconsidering their decision because of the interest shown in the exhibits.

DR. JOHNSTON of Grand Rapids said that they had had a campaign of that sort under the auspices of the Blodget Home which had done a great deal of good. They had two clinics weekly and had secured from the health department the names of the parents of every baby born during the year and at the end of the year found that the mortality was 55 per cent. less than it had been any year during the five preceding. He said that while it would be too optimistic to attribute all of this decrease in mortality to the influence of the education by the exhibits, he thought that a large share of it was a direct result of it. He also remarked upon the eagerness of the people for information regarding the care of their babies.

DR. KERR of Brooklyn thought that the object of the paper would be defeated from the fact that pediatricists as a separate entity were not well recognized. He said that in the New York State Society pediatricists had only been recognized within the past few weeks, the tendency having been to make this specialty subservient to obstetrics. He thought that by admitting that there were too few well-trained pediatricists ammunition was placed in the hands of those who were anxious that the pediatricists did not have this work in charge.

DR. HOWE of Albany, health commissioner for the state of New York, said that the difficulty would not be with the health department in too quickly assuming charge of the welfare work, but with pediatricists for not taking interest enough in it. He said that the health department realized that it should be guided and directed by those versed in the care and treatment of children, and that the executives would not pretend to instruct mothers in the care of their children. But that they had had prepared a little booklet dealing with the mother, her care of herself, her preparation for motherhood, and the care of the child, and that it was the expectation of the department to place one of these booklets in the hands of every expectant mother. He urged all pediatricists to cooperate with their local departments in this work, characterizing it as the greatest field extant for preventive medicine.

DR. MCKEE of San Francisco challenged the statement in the paper that the only result of milk philanthropy was the discovery that milk alone had not been so much to blame for infant mortality as had been supposed. He wished to know how one could



properly feed an infant unless the milk was right to start with and he thought that one of the most important things of the whole movement was the ability to get certified milk.

DR. HARRINGTON of Milwaukee said that some three years ago their county had attempted to start child welfare work through bringing a social worker in each district. That work had been successful in the Polish district where it had been started, reducing the death rate about 60 per cent. This worker, with his nurse and under the guidance of a physician, sent nurses into every home in which it was reported that a baby had been born and educated the mother in the care of her child. The newspapers endorsed the work heartily and it did so well that it had recently been assumed by the health department, the social worker who started it having been replaced by a physician. He emphasized the fact that a physician to be successful in this work should also be a trained social worker or he would fall short.

DR. ZAHORSKY of St. Louis thought that one serious drawback would be that pediatricists were not in unison in their recommendations of methods of feeding so that the education would be constantly being revised and would never arrive anywhere. He thought another difficulty would be found in getting a sufficient number of pediatricists to carry on the overseeing of the work.

DR. COOLEY in closing said that he did not intend to intimate that trained pediatricists were few, but that it would be hard to find enough of them to undertake the supervision of the work. He said that perhaps his remarks on milk philanthropy had been poorly expressed, but what he intended to say was that the mere supplying of pure milk, without welfare work, educating the mothers how to keep it free from contamination in the home, how to modify it and how and when to give it, did not accomplish much. He said that milk philanthropists themselves had recognized this and had gone into welfare work and were doing wonders. He thought it perfectly possible for pediatricists to agree upon the feeding of normal children, where their disagreement occurred was in the sick child, and that was a matter for individual attention, so need not hinder the progress of the movement. He wished again to emphasize that the purpose of his paper was merely to urge pediatricists to take a hand in this work.

*The Value of the Social Service Department to the Children's Dispensary* read by MAURICE OSTHEIMER of Philadelphia. He said that within twenty-four hours after a child has been examined in the Children's Dispensary of the Hospital of the University of Pennsylvania, the Social Service Department nurse visited the home, investigating its sanitation, housing, hygiene, food, illness and the work being done there. She explained the physician's orders when necessary, saw that they were being carried out, left diet lists, corrected abuses or bad habits, and saw that the child came regularly to the dispensary. If she

found other conditions of illness she referred them to the various departments of the hospital, helped some to sanitariums or open air schools, secured positions out of doors for others, light work for convalescents, and even attended to washing out of the stomach or bowels when necessary. Recently she had been able working in conjunction with the Children's Aid Society to secure homes with wet-nursing mothers for babies with inanition. He said that the dispensary mortality, especially during the summer, had been greatly diminished, many conditions which had been considered incurable by parents had been markedly improved or cured and excellent results secured through instruction in diet. He said that a report of this kind was but a slight indication of the possibilities presenting in the wide field of education of the ignorant.

DR. LONGRANDOM of Milwaukee said that their newspapers gave lists each day of the names and addresses of people to whom babies had been born and that invariably the proprietary food people used these lists for their promotion literature. The day after the report a sample of their food was sent to the mother, with directions for its preparation, a booklet describing its use, giving the experience of others and, in most instances, data on the care of the child. He thought that this was wrong and that pediatric societies should look into the matter and if the practice was common have the matter taken up by the postal authorities. He said that as long as free instructions in the use of infant foods was given to mothers, many, ignorant of the dangers of proprietary foods, would use them.

DR. FUSSELL of Philadelphia said that by personal contributions and solicitation they had started a social service department. This work had been done almost entirely in the out-service department, but its results had been little less than marvelous. Its chief was a very able, versatile man, and where previously the work had been quite perfunctory, under his management and skill it was accomplishing a great deal. In unusual cases, either in view of the seriousness of the case, or the suspected ignorance and shiftlessness of the home, they were followed up, into the homes, to see that directions were carried out. The most brilliant results, he said, were in the children's departments. All cases of tuberculosis were followed up by a special tuberculosis worker who made it her business to visit the home, look into its hygiene, sanitation, ventilation, etc., and if they need more attention than she could give, to report the conditions. During the reading of Dr. Ostheimer's paper he thought some might misunderstand the duties of the nurse. These, he explained, were exactly those of any nurse in private practice—a trained assistant to the physician. She did not attempt to treat any of the members of the family whom she found suffering from diseases or abnormalities, but referred them to the physician in charge. If he found a child needed the attention of a specialist for disorders of the eye, ear, nose, throat, for in-

stance, he referred them to the proper department for treatment, but in all cases the first physician was in charge of the case and knew exactly what the patients were doing, just as in private practice where the family physician finds it necessary to consult a specialist.

DR. COOLEY of Detroit thought that child welfare work had come to be quite as much sociologic work as medical and that unless physicians realized it, and fitted themselves to meet the varying problems that presented in these complex conditions, they were scarcely able to handle the work.

DR. FUSSEL wished to interpolate into his remarks that all of the dispensary cases were followed up by a visiting nurse to see that they were really deserving of free medical aid. He said that unless this was done the dispensary would work harm to physicians in private practice by taking from them patients who were able to pay and should be willing to pay for medical service rendered. He believed that the social workers should combat the harmful influence of the nurses maintained by the proprietary food manufacturers in many towns, whose duty it was to go into the homes of the poor and instruct the mothers in the preparation of their particular food.

DR. DOUGLAS of Detroit thought that physicians teaching medicine should not be too severely censored for the fact that their students did not understand infant feeding. He said that the subject was passed over so lightly by the other departments of therapeutics and practice that it was little wonder that the students did not attach much importance to it. He thought that it would be as reasonable to suppose that a pediatricist should be able to direct a student in his study of present-day surgery as for a surgeon to attempt to outline proper methods of infant feeding. He said that until the faculty of the colleges were up to date on these matters, and appreciated the importance of the work of the pediatricists the young doctors would be at sea when they came into practice and have to rely upon the ready-made directions of the proprietary food manufacturers for instructions in infant feeding and the mortality would continue high.

DR. OSTHEIMER, in closing said that the subject had been so well grasped that there was but one thing to add, that was that in visiting homes to see the conditions under which the child was living, and its care in the carrying out of the treatment, many adults were found in need of medical or surgical advice and these were referred to the adult departments of the dispensary.

*Some Reasons for Surgical Failures in Children.*—DR. LEGRAND KERR (Brooklyn) said that to the surgeon "success" meant one thing, while to the lay mind it meant another and that it often required one on neutral ground with mutual interests to adjust the two conceptions. This, he pointed out, was the opportunity of the family physician, being closely associated with the family and yet appreciating the possibilities and limitations of surgery.



More could be done, he said, by the family physician to restore confidence and maintain a sane attitude toward surgical procedure than by any other. He impressed that to make surgical examinations one must thoroughly understand the normal, and that all possible examinations should be made before a decision was reached. If this were done there would be less unpleasant after-feeling and fewer failures. Such examinations should be supplemented by detailed history of previous conditions. He said that it was not a common practice among surgeons to obtain a history of the patient's previous illnesses and possible exposure to contagious disease and that this often resulted disastrously. While he did not wish to be understood as saying that every child required the examination of a pediatricist, still he believed that too often surgeons attempted to cope with conditions which they understood thoroughly but presenting in an anatomy with which they were not familiar thereby mitigating their success. He thought that consultation between the two would enhance the chances for the child's recovery and the reputation of the surgeon. He said that while in abdominal pain appendicitis was immediately thought of, and in nervous disorders meningitis was never overlooked, these conditions were too often assigned as the cause when they were not. He thought, too, that often the surgeon, realizing his unfamiliarity with the condition, brought about a feeling of insecurity and timidity and that this, combined with inefficient help, created a psychological element that was not conducive to success. In a condition where the work of each one was as important as this, to have the interne more interested in the technic of the operation than his care of the child, or the nurse watching the operator rather than attending to her duties, sometimes worked irreparable harm, not, however, so much with the mortality as with the morbidity because each contributed its quota toward the shock. He said that hemorrhage was usually the result of pulling or dragging an organ and that this unnecessary injury done by the assistant added to the degree of shock. He deplored the practice of assigning the last-admitted interne as anesthetist, saying that until the anesthetist was placed upon the plane of an equal, a valued coworker, there would continue to be trouble with the degree of anesthesia. He believed that the danger from anesthetizing young children was not as much from asphyxiation as from the absorption of toxins. He thought that postoperative attention should be more closely watched by the surgeon, that he should not be satisfied with having restored normal balance by removing the surgical cause, but should do everything possible to get the patient in a condition to enjoy normal childhood. He believed that until complete diagnosis was the rule, rather than the exception as it now was, as shown by the lack of appreciation to the manner in which children react to injury, success would not be good. And that often children suffered from too much, rather than too little, surgery. He said that un-



consciously these conditions molded the public mind and that until they were corrected, and careful, painstaking after-treatment carried on by competent assistants under the direct supervision of the surgeon there could be no restoration of confidence to the lay mind. He thought that this education was largely in the hands of pediatricists.

DR. NEFF of Kansas City emphasized the matter of the importance of previous history. He said that nose and throat men frequently operated without consulting the pediatricist, with serious after-effects. He had had two such instances where the operation had been advised, but he did not consider the child in condition to undergo it. In one case the child had been the victim of acidosis producing vomiting, and if he had known the operation was to be done he could have made suggestions regarding anesthetizing and after-care and washing out the stomach that would have been of value. As it was, the child vomited for about three days after the administration of the anesthetic (which in this instance was administered by a specialist in his line). The complicating condition in the other case was the fact that the child had been a bleeder all his life, and severe hemorrhage followed the removal of the tonsil.

DR. SPINNEY of New York called attention to the fact that in giving an anesthetic a most potent drug was being given to a patient to whom it is almost deadly, and the irregular dropping of indefinite quantities could not produce a uniform result. He believed that the peculiar excitement of ether was responsible for many sudden deaths, and that its intermittent dropping, and renewing the anesthetic from time to time was particularly dangerous. He said that often the danger of toxemia was of far more importance than the cyanosis. He called attention to Bloodgood's recommendation of short anesthesia so that one might see how the child responded to it.

*Juvenile Psychasthenia.*—DR. TOM A. WILLIAMS of Washington, D. C., said that psychasthenia was a disease of obsessions dominated usually by morbid fears and day dreams. He said that Janet did not believe it occurred in children, but in his practice he had found it not at all rare. He thought that the first step in treatment was to find its cause, then explain it to the parents and secure their cooperation in the treatment. He had found the fear of bodily harm much more active than sexual instincts so emphasized by Freud. In one adult case reported the cure covered a period of a year and a half and it was traced to lack of common sense in her childhood training. In children he had found the cure a much more simple matter. He does not place the dependence upon dreams as most authorities, having found that he could get the same information more rapidly and more reliably in direct ways. He thought psychasthenia arose as a subconscious protest against unnatural conditions and if this was discovered early the chances for recovery were excellent. He said that after discovery of the agency which had created the

condition, the second step was to devise a method to get rid of it, not in an empiric manner, but according to the psychology of the child.

DR. ZAHORSKY of St. Louis thought that the subject should be given more careful study by physicians. He said that their ignorance of these conditions was evidenced when the subject was brought up by the fact that they could not even discuss it.

In closing, DR. WILLIAMS said that one reason why pediatricists did not study the subject was because in books it was given in such a complicated, unsatisfactory manner as to lead them to suppose it was a matter which few could understand, whereas he had found it exceedingly simple. He said that he studied these patient's minds just as one would any diseased member of the body and he had found that the treatment was just the enlargement of common sense. He had found the child mind exceedingly simple to understand because they were more frank, not having had the training in concealment which, unconsciously or otherwise, was present in most adults. He had not found it difficult to win the confidence of children and said that in the first case recited in his paper he had seen the child but once for half an hour. The second was also seen for about half an hour and the treatment outlined. The last case was more complicated, the boy was thirteen years old, and he saw him four times, about half an hour each time. This he considered a difficult case and said that it took several months to restore him to a normal, healthy condition. He said that when this was compared with the consultations and treatment necessary for the treatment of other diseases of childhood one would realize that it was not such an abstract thing for pediatricists to handle.

#### THIRD DAY.

##### *Morning session, June 6.*

*Election of officers.*—Henry Dwight Chapin, New York, Chairman; J. M. Miller, Atlantic City, Vice-Chairman; Frank C. Neff, Kansas City, Mo., Secretary; Charles Douglas, Detroit, Delegate.

*Methods of Estimating Kidney Function* read by RICHARD M. SMITH of Boston. He said that the elimination of water alone was no criterion of the function of the kidneys. That even in normal individuals, under normal conditions, the amount varied greatly. The process of the kidney, he said, is largely one of filtration. He thought that the excretion of sodium chloride alone was not a positive indication of the functioning power of the kidney, that the truest test was the elimination of urea, but that it was hardly a practical test for the ordinary physician because it was so difficult of accomplishment. He presented a method of introducing into the body, daily, a dye, phenolsulphonophthalein, which being practically all eliminated and having no action upon the kidney would enable the physician to estimate

its function. He said that it took about ten minutes from the administration of the dye to have it appear in the urine of normal individuals; all the urine passed within the next hour (in normal individuals about 100 c.c.) was collected and made strongly alkaline. This solution was compared with a solution of phenol-sulphonaphthalein which made the same shade in pink in the test-tube as the urine (allowance being made for the slight difference the normal color of the urine would make by looking at the solution of the clear drug through a yellow glass) and in this way the function of the kidney was accurately determined. He had found that normal individuals eliminated from 40 to 60 per cent. of the drug during the first hour. He recited cases from his practice showing the value of the drug as an aid in the diagnosis, prognosis and treatment of nephritis but said that it would not determine the ability of the kidney to excrete salt, water or proteid.

*Influence of Climate on Summer Diarrhea of Infants.*—DR. L. T. ROYSTER (Norfolk, Virginia) said that the common causes of summer diarrhea in infants were milk decomposition, bacterial infection and heat. His paper was to deal with the influence of climate, alone, upon the condition. He had investigated twenty-eight cities for statistics on mean temperature and humidity and the prevalence of summer diarrheas. In making his charts he found that the death curve followed the 2 P.M. temperature curve very closely, that in the country the mortality was lower than in cities and that when children from crowded districts were taken to the seaside they recovered very quickly. Where this was impossible he had found good results to follow frequent sponging and living almost entirely in the open air. So that he believed the question resolved itself into one of radiation rather than actual heat, as anything which prevented radiation brought on prompt, vicious symptoms. Among the poor he had found that the heat was greater indoors at night than it was out, so radiation was prevented. He said that the majority of cases occurred at the first onset of warm weather, rather than at mid-summer when the heat was most extreme and the humidity more even, but that the accumulation of conditions made the death rate highest in the autumn in white children, while negroes, having less resistance, were apt to die in the spring at the first onset of the disease. He believed the artificially fed had less resistance than the breast-fed. He said that some of his findings seemed to corroborate the theory of heat as a contributing factor, while others seemed to disprove it, but that it was hard to get dependable figures because in many cities the statistics were irregularly kept. He read the mean temperature, humidity and death rate, based upon gastroenteritis under two years, showing that in every instance the greatest death rate followed the



increased humidity. When the temperature was high and the humidity low there was not as large a mortality as when the humidity was high and the temperature low. He found that usually the highest point in the death rate was two or three days after the high humidity. He said that he realized that this investigation could not prove much, but it showed that there was a connection between humidity and summer diarrheas and if it would be possible to determine how much of the sick rate was attributable to it many infants might be saved.

DR. HOOBLER of New York said that while at first glance it would seem that these were conditions beyond the control of the physician, therefore hopeless, it should be remembered that many of the infants were in hospital wards where temperature and humidity would be controlled. In his investigation of best methods of ventilation he had taken many records of atmospheric pressure in wards and from his study of them thought he had found a direct connection between weather and circulatory conditions which might account for deaths from summer diarrhea. With high humidity there was low barometric pressure and as the humidity went up he had watched the blood-pressure go down so that he thought this might have its influence.

DR. PISEK of New York thought that temperature in children was from heat retention and that accounted for the disorders following the rise in temperature by two or three days. He said that if it could be brought down promptly the trouble might be averted. He thought the best treatment was substitute feeding and plenty of fresh air. He thought there were too many other factors that helped to bring on summer diarrhea to determine anything dogmatic from humidity, and that the more one studied it the more confused he became. He thought that the best preventive lay in education of mothers in early recognition of the onset of the trouble, that if they understood what steps to take and took them promptly the mortality would be greatly reduced. He said that in hospital wards if the babies could be supplied with cool, dry air they would not suffer from summer heat.

DR. SCHWARTZ of New York said that the statistics of small towns could scarcely be compared with those of the large cities, where they sometimes reached seventy-five in one day. He called attention to the teaching of the Germans, known for fully a hundred years, that there was a direct connection between heat and summer diarrhea. He had made charts for the city of New York and found that the death curve just about paralleled the humidity curve but showing its apex and decline about twenty-four hours after the humidity curve. He thought that children died from loss of body moisture because in June, July and August in New York when the heat was intense and the humidity low there were more deaths than when the heat was not so great, but the humidity higher. He said that in all climates where there were extremes of heat and cold there were summer diarrheas among children, but in either cold climates or



tropical there was no acute mortality angle during the summer months.

DR. ROLLINGS of El Paso, Texas, said that their humidity was very low, the entire rainfall for the year being but about 10 inches and yet they had a great deal of gastrointestinal disturbance during May and June when there was practically no rain but the heat was intense. He sent these children to the mountains, to an elevation of about 8600 feet (5000 feet higher than El Paso) and they showed remarkable improvement, in spite of the fact that there was considerable rainfall. For this reason he was strongly of the opinion that heat was a large factor, although he emphasized that food must be given its place.

DR. ILLOWAY of New York thought that the study of summer diarrheas in clinics would scarcely give a physician a conception of the part played by heat in the tenements. He said that if a physician would visit a few of those homes he would lay great stress upon the influence of heat. He believed that heat increased peristalsis and diminished the functions of the stomach. He thought that when humidity was increased suddenly it produced cholera infantum.

DR. BUTTERWORTH said that in New Orleans the humidity was greatest in May and that the mortality was greatest in April, May and June although the extreme heat did not come until later in the summer. That further south the highest mortality was even earlier in the spring, and during the rainy season there was almost complete freedom from diarrhea. He said they could take a child from New Orleans to the gulf coast, where the temperature was about the same but the humidity much greater, and save its life.

DR. ZAHORSKY of St. Louis thought that high curves following increase in humidity and temperature were due to the fact that many children, already suffering from nutritive disturbances, were made worse by the onset of the heat. He had found sickness following heat almost as common in children between two and five years old as in infants.

DR. JOHNSTON of Grand Rapids said that experimental cases of severe cholera infantum had been produced in hospital wards by the increase of heat.

DR. DOUGLAS of Detroit said that he had been educating mothers to reduce the food of infants about 25 per cent. during and immediately after a hot wave, giving cool water in its place and in older children not giving them milk to drink. He thought that he had produced very good results in this way.

DR. MCKEE of San Francisco said that except for a narrow strip between the mountains and the coast, the state of California was extremely dry and the heat intense and summer diarrhea, as seen in the east, was practically unknown. He said that the heat sometimes reached 100° for weeks at a time, that conditions of care and feeding were practically the same as those of the east, yet there was no gastric disturbance. He attributed it to the

out-of-door life lived by the people, and agreed with Dr. Royster that radiation played as important a rôle as heat or humidity.

DR. PARKE of Birmingham, Ala., thought that statistics were misleading, because the symptoms of summer diarrhea in Boston, for instance, and in New Orleans, were totally unlike. He said that in London he found physicians very skeptical of his description of summer diarrhea as seen in Birmingham because they had never seen it in its severity. He thought that there was a great deal more to be considered than heat and humidity—that diet and infection were most important factors. He had seen children infected from other members of the family, but he said what the germ was, or where it came from, had not been determined.

DR. ROYSTER said in closing that he realized that many things contributed to the onset of summer diarrhea, but that his paper, as announced in the title, considered only the influence of climate, that he had made no effort to draw conclusions, but merely presented the facts as he found them from his investigation of the records of twenty-eight representative cities. He said that in Phoenix he found a most interesting condition—while their heat frequently averaged  $108^{\circ}$  for days they have a humidity of only four, a condition almost inconceivable to an easterner. He had been assured that the hotter the weather became the less gastric disturbance there was. In the vicinity of Phoenix were 20,000 people with a record of but twelve deaths, occurring just about one a month. He agreed that our records could not be compared with those of Berlin or London with any idea of drawing conclusions because conditions were so different. He said that in the vicinity of Norfolk children were sometimes taken out on boats in the morning in a state of total collapse and left out all day to come back at night refreshed and invigorated, so that he had concluded that radiation was an important factor. He said that during a siege of scarlet fever the temperature got to  $108^{\circ}$  and the symptoms were alarming and they began dipping the children into ice baths one after another and lost none of the cases, although there were several near to prostration. He thought that studies should be directed more along preventive lines rather than reduction of mortality, because that would naturally follow. He had noticed change in the character of the stool from year to year—one year the true diarrhea stool, the next watery, and the other that of cholera infantum.

*Effects on Later Development of Severe and Prolonged Illness in Infancy.*—DR. THOMAS D. PARKE of Birmingham, Ala., presented lantern slides showing the bony development in the wrists of children who had been severely ill, or emaciated for a number of weeks or months, in infancy. These x-ray pictures showed that although they might even be above the average in general bodily development there was usually injury to the bony development which was never overcome. In most of the slides

all of the bones that would be expected according to the years of the child were present but their structure was not complete. From his examinations and measurements he concluded that while some cases are apparently little effected there was a lack of uniformity in the bony structure.

#### DISCUSSION.

DR. PISEK of New York said that there was great need of measurements from the second to the fifth year, that no statistics had been gathered for a great many years and that it was frequently a handicap to the physician not to know just how much underdevelopment there was in a child. He said there was also need of measurements showing the relation of the head to the chest, the chest to the abdomen, etc.

*Exophthalmos in Scorbutus.*—DR. L. R. DEBUYS of New Orleans prefaced his paper with a résumé of the literature of this condition and then gave the clinical picture of the following case: Extreme protrusion of the left eye outward, downward and forward. Aside from cholera infantum the only illness had been a siege of boils lasting throughout the previous summer. The first protrusion only lasted a short time, then the eye went back to apparently normal condition. In three weeks time it protruded again, and again went back to protrude a third time very soon after, and at that time he had been called. The second and third times the condition occurred at night and was discovered when the child awoke in the morning. It was a poorly nourished child. The movement of the eyes was not interrupted. It was extremely sensitive all over its body and upon being lifted, or even touched, cried out in pain. Examination of the abdomen showed it to be flabby, but the liver was normal and the spleen not felt. There was marked swelling in both legs below the tibia. Respiration was normal. He gave the usual antiscorbutic treatment and orange juice and it improved promptly and steadily. Skiograph showed unmistakable scurvy. The diet was not changed because the parents did not wish it, but the treatment given promptly cleared up the symptoms. He thought that usually a therapeutic diagnosis would differentiate between scurvy and exophthalmos, but if the treatment did not alleviate the symptoms in four or five days the diagnosis should be questioned. While in this case the protrusion was confined to one eye, he said that it frequently affected both.

#### DISCUSSION.

DR. McCLANAHAN of Omaha said that he saw on an average of four cases each year, usually brought in to him from the country. In most of the cases they had not gone to the state of gingivitis upon which so much stress was formerly laid. He found in almost all of his cases hematuria, which sometimes confused the diagnosis. He thought that scurvy was usually caused by feeding proprietary foods.



DR. BUTTERWORTH of New Orleans said that it seemed to him almost unbelievable that with all the education of the present day physicians would still confuse rheumatism and scurvy in the young.

DR. DEBUYS in closing the discussion said that the English paid more attention to examination of the urine, it being an almost routine measure, so that they frequently found hematuria present. Rheumatism seemed to be the condition most frequently diagnosed in cases of scurvy.

*Anesthesia by Pharyngeal Insufflation.*—Read by DR. FRANK W. PINNEO of Newark, N. J. He said that the elements contributing to an ideal anesthesia were quick induction, even maintenance, prompt and complete recovery; that age and body weight were as important as feeding and induction, that the labors of the surgeon increased, not decreased, with increase of the anesthesia. He called attention to the need for gentle manipulation and the dangers in prolonged operation. He said that the demand of the present day was not the discovery of a new anesthetic but greater accuracy and refinement of the methods now in use, the need for a technic which would insure safe and sound anesthesia, just deep enough. In surgery of the mouth and nose this was extremely difficult because the surgeon and the anesthetist, under the present technic, occupied the same field, so that the anesthesia was constantly interrupted, one time deep, then the patient almost awake. Even the most careful surgeons were handicapped by want of uniform anesthesia. Renewal of the anesthesia from time to time was most dangerous, if not deadly, because the safety limit was trespassed upon. The closed method was dangerous because of the unevenness of the administration. The open method was also dangerous, on account of interrupted respiration; and the semi-open, while a compromise between the two, had not produced as good results as desired. He had used sequence—nitrous oxide alternated with ether—with best results but it called for experience and skill in handling the apparatus. A good anesthetic must be a most delicate recording apparatus, uninterrupted, capable of as deep anesthesia as required, it must leave the nose and the throat clear and the ether vapor must be warmed. In other words, he thought that the method should be absolutely safe and simple. He presented an apparatus which he had used for three or four years with excellent results. It was designed especially for ether, but could be used for chloroform. It had a maximum, constant pressure of 30 millimeters but was fitted with a stop-cock so that the flow could be regulated to just the amount required. There was one bottle fitted with an electric, or hot water, heating apparatus through which the ether passed for warming before it reached the patient, which also served to catch any liquid ether which escaped. The chief feature of the device, however, was that the anesthetic might be given either through the mouth tube, the nasal tube, or the nasal catheter,



leaving the field of operation entirely at the disposal of the surgeon. While designed mainly for nose and throat work he said that it could be used very well in other operations, its advantageous features being that the vapor maintained an even temperature of  $87^{\circ}$  to  $84^{\circ}$ , that the field of the surgeon was never encroached upon, and the air pressure could be maintained by either hand or foot.

#### DISCUSSION.

DR. GWATHMEY of New York thought that the practical benefits of heating ether had been very good, although for a long time it had been supposed to be impossible to modify its temperature. In anesthetizing children he thought that the loss of heat was one of the chief causes of shock, so that it was essential to use every means to avoid it. He said that the addition of a little essence of orange to the ether would avoid the cyanosis that sometimes accompanies its administration. He did not believe in the use of chloroform with children except in extremely hot weather and even then thought it should not be used continuously in view of the physiological and clinical results following its use which are so well known. He thought chloroform and ether sequence the best anesthetic for children because the mask terrified them, bringing in a psychological element which prevented even results. He thought that the best method was to have the child put to sleep naturally, then, putting a little essence of orange on the mask to drown the odor of the ether, give the anesthetic before it awoke. In this way the breathing soon became automatic and the results were very good.

DR. WOOLSEY of Brooklyn thought that the extreme susceptibility of children to toxins made the subject of anesthesia an important one. He thought that the chief objection to the open-drop method was that the irritating effects of ether were so strong as to produce an obstruction which prevented the child's getting enough ether to completely anesthetize it. He said that with concentration of the vapor and the tube passed below the point of possible obstruction a more even anesthesia was maintained.

DR. PINNEO in closing said that the point of overcoming the child's terror was an important one. He did not advocate the use of nitrous oxide in children because their air spaces were too small. He advised chloroform in sequence because the statistics do not show the high mortality that plain chloroform does.

#### *Afternoon Session, June 6.*

*The Relationship between the Tuberculous Infection in the Child and Clinical Tuberculosis in the Adult.*—DR. F. M. POTTENGER of Monrovia, California said that nearly all children were infected with tuberculosis before the fifteenth year and that many of the clinical symptoms developed in adult life were due to the

original infection. But he thought that where the disease was cleared up and the lesions healed, the early infection afforded considerable immunity against further inoculation from either within or without. He said that in children it was almost invariably a disease of the lymphatics. In some cases it healed, and in others lay dormant to break out in renewed force in adult life. He classified the infection into three stages: first, the lymphatic; second, the extension; and third, the clinical. In guinea-pigs he said that the second infection produced a chronic, inactive tuberculosis showing that the first infection was, in a way, a safeguard against a virulent outbreak. He said that if the early infection did not produce death at once it brought about a latent condition which permitted the patient to carry on his business for a number of years, to finally have an acute onset of symptoms from which he rarely recovered. He said that these facts, proven by investigation, called for a revision of work done on treatment of the disease, because if it was going to be prevented and cured, the preventive measures must start in early childhood at the time of the first inoculation. This he thought called for more universal use of the von Pirquet tests. If a strong, rapid reaction was produced he thought that it indicated an active lesion, while if it did not appear for about forty-eight hours and then grew gradually more and more pronounced it pointed to a more latent type.

#### DISCUSSION.

DR. AMENDE of New York said that he used the Moro test in children, having found it adequate and easier to give than the v. Pirquet. He had given children, and cases of the advanced type in adults, a treatment consisting of quinine one part and iodoform one-fifth (adult dosage) with very good results. Under this treatment, he said, the enlarged glands would steadily disappear and that it was easily carried out and the dosage could be modified according to the age of the patient.

DR. KNOPF of New York thought that the Moro test did not amount to much, that the von Pirquet was of value as a diagnostic aid in children under five but that over that age one would almost invariably get a reaction which could only mean that there had at some time been tubercular infection. He thought that the intensity of the reaction was a valuable guide. He said that children were very apt to contract tuberculosis, even in early infancy, and that in examinations at the health department he had found about 50 per cent. of all children giving evidence of active tuberculosis. He believed that it could be contracted in adult life where there had been no infection in childhood if there was prolonged exposure. He thought that the best measures for both prevention and treatment were careful feeding, hygienic living in the open air. He thought that open-air schools should be the rule rather than the present-day exception.

DR. SILVIO VON RUCK of Asheville, N. C., said that with very

few exceptions all the children of tuberculous mothers in their institutions showed definite evidences of infection, but, he said, the main difficulty was that they did not see the children early enough to institute preventive measures. They treated mainly with tuberculin but had tried to go farther, using vaccine as a preventive to the well members of a family where one was infected, or in other cases where there had been exposure to infection. He said that any such preparation to be satisfactory should be safe, uniform and confer immunity in one or two doses. He thought they had developed such a vaccine and said that the results of their experiments would soon be published and the preparation given to the profession. He said that if it worked as well generally as it had in their institution its use combined with ordinary prophylactic measures would succeed in stamping out the disease and would prove as good an immunity to tuberculosis as the small-pox vaccine had in that disease which used to run so rampant.

DR. DUREL of New Orleans thought the leukocyte count an aid in diagnosis. He said that in all his examinations children with tuberculosis showed a higher percentage of the mononuclear cells than were normally present. He believed that the only thing that would establish the value of tuberculin would be whether there was in it a good treatment or not. But he emphasized that in any of these measures the general treatment and attention to hygiene and fresh air should not be omitted.

DR. RITTER of Chicago thought that in infants of from six months to two years of age the Moro test was quite reliable and from two years to ten years the von Pirquet could be depended upon. Tuberculin to be satisfactory, he said, must represent all of the antibodies present in the disease because it was not known in any individual case just which were present.

DR. STOLL of Hartford, Conn., used tuberculin freely both as a diagnostic aid and therapeutically. He did not believe that positive, active reaction necessarily indicated active tuberculosis but thought that there might be an anatomic tuberculosis which only required watching and treatment if it became active. He thought that the delicate child which did not give a positive reaction needed more careful attention than the robust child which did, because the delicate child presented a fertile field for invasion and, if infected, had no vitality with which to withstand the attack.

DR. MCKEE of San Francisco thought that the dosage of tuberculin used therapeutically was of more importance than the kind. He started with 1 10,000 milligram of the old tuberculin given bi-weekly and gradually increased. He said that this amount would not give a reaction and sometimes a very large dose would be tolerated before there was reaction. He wished to know what dosage Dr. Pottenger used.

DR. POTTENGER in closing the discussion said that if one knew that children were infected they had a sound point of departure.



Then, the second point, if to that could be added the information that these children were not doing well you had a foundation upon which to start to work. He thought that rapid, severe symptoms following the tuberculin injection did indicate active tuberculosis and while they might not call for active treatment, still it was well to have the information in hand for guidance. He thought that no test should be overlooked, because those who would react to one would not to another, but in adult life the tuberculin was the most valuable. He said that he had always urged that tuberculosis could never be stamped out with hygiene alone. If it was going to be overcome it must be through the universal use of a preventive vaccine. He said he had used tuberculin of the soluble and insoluble antibodies because the matter of the definite cause of each individual's infection had not been settled. He emphasized the importance of learning to use one tuberculin successfully and sticking to it. He thought that by changing and giving varieties with which one was not familiar the patient was kept in a hypersensitive state and best results were not obtained.

*An Automatic Device for Reading Systolic and Diastolic Blood Pressures in Children.*—Read by B. RAYMOLD HOOBLER of New York. He said that great difficulty had been experienced in reading blood pressures in children by means of tactile pressure over the radial arteries or by means of auscultation over the brachial artery. He demonstrated a device which was absolutely automatic and standard, by which there was no question of hearing or feeling or the influence of the personal equation. It consisted of a double cuff, one to fit above the elbow and the other below the elbow. The lower cuff was attached to a modification of a Fedde's pith-ball indicator, so that when pulsation was permitted to pass under the upper cuff it was recorded by means of the lower cuff and was shown by the oscillation of the pith ball. In very small children the cuff could be attached to the limb and the pressure correctly read by allowing for the 10 degrees deviation between pressure in the arm and in the leg. Through the use of the device blood pressures were standardized and the reading approximated very closely that of the Erlanger sphygmomanometer.

*Effect of Cold Air on the Blood Pressure of Tuberculous Children.*—DR. HOOBLER read this paper also showing from a large number of experiments that the blood pressure of children in various stages of tuberculosis was considerably below the normal. But when a patient was transferred from a warm hospital ward to the open air there was gradual increase of blood pressure. If the patient was kept constantly out of doors he found that the pressure reached nearly normal limits and sustained that point as long as the patient remained out of doors. He found that the more advanced the case the lower the pressure went in the ward but when transferred to the open air it rose proportionately more degrees so that even quite advanced stages approximated



very closely normal pressure. He considered this the most rational basis for urging such measures as open-air schools, roof camps, open air play grounds, sleeping porches and practically living in the open air, not only for tubercular children, but all classes of debility and lack of vitality.

#### DISCUSSION.

DR. POTTENGER of Monrovia wished to know if pressure of other than pulmonary types of tuberculosis was included in the series. He thought that the reason for the reduction in pressure was the effect of the toxins in the system and he wished to know whether nonpulmonary tuberculosis showed the same absorption of toxins. He said that the action of the diaphragm was interfered with as soon as there was action upon the lungs and this was one active cause of reduction in blood pressure, also one of the reasons for the extreme pallor of tuberculous children. He characterized the advanced stage as that showing general waste, cardiac degeneration, etc. He thought that the effect of cold air was purely physiological and that no conclusions might be drawn from it. He wished to know if experiments had been made upon normal children to see if they showed the same raise in blood pressure upon removal to the open air.

DR. RITTER of Chicago said that he had recently reported the result of 400 blood-pressure tests in adults and children and wished to know if the essayist had made any comparative tests in pressure when the patient was standing, sitting, and reclining. He had found that where the pressure was high in a reclining position the pulse was rapid. He found an average of three points difference in the pulse in the three positions and about six points variation in the blood pressure.

DR. HOOBLER said, in closing, that this series was all pulmonary cases, that he had records of pressure in the glandular type and tuberculosis of the bones, but did not wish to include them in this series. He also had noticed that frequently the splanchnic area appeared to be dilated and filled with blood, which he thought would lend color to the idea that the blood was not being evenly distributed and that with the breathing of cold air all the organs were stimulated and the circulation improved. He had made tests on normal children and found that removal to the outdoor air raised their temperature from five to eight points, while in the tuberculous it raised it from whatever point it had reached below normal to very nearly the normal. He said that his tests were made with the children in bed and all under as nearly the same conditions as possible for purposes of comparison.

*The Diagnosis of Enlarged Bronchial Glands.*—DR. HENRY F. STOLL of Hartford, Conn., said that frequently, especially in slight involvement of the bronchial glands, there were no symptoms. When they were of tubercular origin there were the usual manifestations of the toxemia of that condition. In some cases there was more or less constant pain in the thorax, while in others

there was vasomotor instability as an annoying symptom. The pulse might be rapid and the temperature reach  $99^{\circ}$  in the afternoon. There was to be expected more or less indigestion in women, this was a particular symptom at the menstrual period. The glands frequently reached a large size with no coughing. In diagnosis he thought interscapular whispered bronchophony the most valuable sign but it should be borne in mind that this might be caused by a dilated left auricle or an aneurysm of the aortic arch. Paravertebral dulness was often present, he found, when neither vertebral, sternal or parasternal dulness could be detected. He found the spasmodic, thoracic cough present in a great many cases but it was not frequent enough to be called an invariable sign. He said that very light percussion must be employed or there would be a confusing vibration. He placed final dependence for a diagnosis upon the x-ray and found the usual appearance a shadow in the first and second right interspaces to the right of the vertebræ sometimes seemingly out of all proportion to the actual enlargement.

#### DISCUSSION.

DR. RITTER of Chicago wished to ask the doctor if he had used Smith's sign and, if so, if he relied upon it.

DR. POTTINGER of Monrovia thought that such enlarged glands were far more common than were supposed and were diagnosed with difficulty. He had always held to the belief that the infection took place in the air passages but recently it had been shown that by tracing the gland back to the part of the lung it drained a definite focus could be located. He said that examination for, and diagnosis of, these glands was a matter that only those working in that line could discuss. He agreed with the essayist that percussion, to be satisfactory, should be very light because only with the merest touch could the deep border of the heart or the liver be outlined. He said that by practicing heavy percussion one deadened their keen sense of perception and overlooked many of the indistinct signs.

DR. MILLER of Atlantic City thought that a gland not sufficiently enlarged to produce an enlarged vein could only be detected by a great deal of experience and those who were particularly acute in making the examinations. He had found the Smith's sign misleading, so while using it in some cases, did not place much dependence upon it.

DR. PISEK of New York said that unfortunately it was rare to have more than one or two of the diagnostic signs that the essayist had enumerated appear in one individual. There might be one or two in one patient and one or two different signs in another, so that the diagnosis was very difficult and could only be made by very careful, repeated physical examinations and recording of findings. He thought all suspected cases should be submitted to the x-ray.

DR. HOOBLER of New York wished to know where the line was

drawn between anatomic and clinical tuberculosis. He thought it hazardous to say that there was a form which might go untreated; that the sooner treatment was instituted the better the chances for recovery.

DR. STOLL in closing the discussion said that he had found the Smith's sign present about as often in normal individuals, especially in stinky children with short, thick necks, as in those having enlarged bronchial glands so that he had come to the conclusion that the thymus must play some part in it, and considered it of little weight in diagnosis. In adults he had found that intrathoracic goiter gave dulness, symptoms of weakness, vasomotor instability that appeared in tuberculous glands, so that these signs must be interpreted with care. He thought that recent literature seemed to show that infection took place in the superficial part of the lung. He wished to re-emphasize the need for very light percussion, almost no tapping at all. He said that he did not know the size of the gland that would first give dulness, except that the dulness is frequently out of proportion to the size of the gland shown in the x-ray picture.

*The Hypodermic Injection of Hematinics in the Treatment of Anemia in Children, with Report of Cases.*—DR. H. LOWENBURG of Philadelphia, after reviewing the literature of this subject, said that in the use of hematinics much depended upon the character of the preparation. He thought iron and arsenic the best remedies, but said they were not practical because of their interference with digestion and the fact that the latter caused nausea. Citrate of iron he had found a good remedy but experienced difficulty in getting it uniform in quality, sometimes there would be several shades difference in the color of half a dozen samples. He had the best results with the light colored fluid. Unless for some reason there was kidney disturbance he had felt arsenic to be contraindicated. He used an ordinary hypodermic syringe for the injection fitted with a steel needle. He had found that a gold needle was not practical, nor was a platinum, on account of its softness. He gave the injection deeply in the tissue of the upper arm, holding the needle at a right angle. The only sensation was a slight stinging which rapidly subsided and left no after effects. He found, however, that where part of the injection entered between the layers of the skin there was swelling and quite severe pain lasting for some time. He had never encountered an abscess. If the dose is too large in two or three hours after its administration there will be intense vomiting, weakness, trembling of the limbs and arms, decrease in the pulse rate and cold perspiration. Upon reclining and the enforcing of quiet the symptoms subside. These overdose effects might also show after several injections had been given owing to the cumulative effects of the citrate of iron. When they appeared after several injections he interpreted it as an indication for cessation of treatment. He recited his experience in 202 cases all of which were rapidly benefited by the treatment except three which had been



practically hopeless when first seen, but even in these the hemoglobin had been raised. From his results he concluded that the hypodermic injection of hematinics afforded a rapid, safe correction for the anemias of childhood, that small doses gave as good results as large without the disagreeable features of the large doses and emphasized the necessity for giving the injections deeply.

DR. ZAHORSKY of St. Louis said that he had had considerable experience in the use of citrate of iron and that he had noticed that frequently infants vomited when but an ordinary dose of three-fourths of a grain was given. He had been reducing his dosage to one-fourth and one-half a grain in young infants, and had as good results from the treatment without the disagreeable features. Another symptom of the treatment was rise in temperature to 99° or 102°. He had never been able to see that any permanent harm came of these symptoms but thought if a method could be devised by which they could be avoided it would be more satisfactory to use.

*Demonstration of a Graphic Milk Chart* was made by DR. CHARLES HENRY SMITH of New York. He had worked the chart out from his own practice and by its use was able to tell just what milk-modification was needed to meet the caloric needs of any infant of given age and weight. The chart, based upon 4 per cent. whole milk, showed just what must obtain if certain percentages of milk were diluted to certain amounts. One part of the chart showed percentage values of the food and another the caloric values. Sugar and proteids were also indicated. By its use the physician was able to tell, without figuring out each individual case, just what a child was getting in the food being given, and to raise or lower its values as indicated by its condition.

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## REVIEWS.

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**INFANT FEEDING.** By CLIFFORD G. GRULEE, A. M., M. D., Assistant Professor of Pediatrics at Rush Medical College; Attending Pediatrician to Cook County, Provident, and St. Bernard's Hospitals, and to the Home for Destitute Crippled Children, Chicago; Associate Pediatrician to the Presbyterian Hospital, Chicago. Philadelphia and London, W. B. Saunders Company, 1912.

The author states that the purpose in writing this book has been, first, to bring to our knowledge the scientific processes which underlie infant feeding at the present time, and, second, to put forth the practical application of these principles in such a way that they can be grasped by one no more familiar with the subject than the practising physician. The book is based on a course of lectures given to the students of Rush Medical College,



and the author acknowledges his indebtedness to many of the recent German writers. He classifies the nutritional disturbances largely according to the scheme suggested by Finkelstein. The first part of the book is devoted to the principles of infants' nutrition, the second to breast feeding, the third to artificial feeding, and the fourth to nutrition in other conditions. Interest centers on the section devoted to artificial feeding, in which the author departs from the generally accepted percentage scheme, to favor a system in which the caloric factors of the food are made the basis of the formulæ. Grulee believes that although the percentage method has done much to advance the science of infant feeding, two arguments may be strongly urged against its usefulness; in the first place, it has been largely responsible for the wholly fallacious idea that the protein is the source of gastrointestinal disturbances in infancy, and in the second place, the error, no less dangerous and widespread in its results, that the advocacy of such complicated mathematical formulæ has driven the large majority of the physicians of the country to the indiscriminate use of patented infant foods. The author is right, therefore, in thinking that if, with no diminution in scientific principles and no increase in infant morbidity, some method can be substituted for the percentage method, it should be given preference. Grulee believes that one of the most important points in feeding infants is to determine the proper length of the interval between nursings, and as cow's milk mixtures do not leave the stomach for at least three hours after ingestion, it is very plausible that a four-hour interval between nursings should bring good results. He therefore advises such a scheme and thinks that it can be instituted in almost every case. This also admits giving the child a slightly larger quantity than if the shorter interval is observed. The best caloric standard is one of forty-five calories of food to the pound weight in twenty-four hours, which although not to be taken as an absolute criterion, shows the amount which when exceeded, is likely to cause difficulty. Grulee believes in the simple dilution of whole milk with the addition of carbohydrates, preferably in the form of malt sugar and various starches, for feeding normal infants between the ages of three and nine months. The book considers the various complications which may arise in feeding and also the nutritional disturbances to which infants are subjected. The text is very satisfactorily illustrated by a series of photographs and also color plates showing the various characteristic stools.

AMERICAN ASSOCIATION FOR STUDY AND PREVENTION OF INFANT MORTALITY. TRANSACTIONS OF THE SECOND ANNUAL MEETING, Chicago, Ill., Nov. 16-18, 1911.

This extremely interesting report deals with an important subject in a manner which will attract attention not only from the medical, but also from the sociologic and economic points of view. Great praise must be extended to the organizers of this

worthy association, which will undoubtedly attract increasing attention from year to year. The scope of the work is well shown by the program of last year's meeting, which in addition to popular addresses on a variety of pertinent subjects, consisted of section meetings on eugenics, midwifery, nursing and social work, continuation of schools of home-making, housing, and city milk supply. The papers contributed to the section on midwifery were of extreme importance and interest. As stated by the chairman, Dr. Mary Sherwood, approximately one-half of the cases of childbirth in the United States are attended by midwives, the remainder by physicians. It is a noteworthy fact that a study of the causes of infant mortality shows that a considerable number of deaths must be attributed to lack of skilled care on the part of the physician or the midwife in attendance at the time of confinement. The program was therefore arranged with the object of studying the qualifications of these two classes of practitioners for their work. The facts brought out in these papers and discussions are somewhat appalling. It was shown that comparatively few medical schools are equipped for teaching obstetrics properly, and that consequently a great many physicians are not qualified to practise satisfactorily this branch of medicine. Statistics of the practice of midwives showed an equally deplorable condition, for ignorant and untrained women in large numbers were found in attendance on confinement cases without any license and without supervision. The principle contributions to the meeting of the section on midwifery was the noteworthy paper read by Dr. J. Whitridge Williams of Johns Hopkins University, in which he presented the results of his extended personal inquiry into the methods of teaching obstetrics in American medical schools. The facts brought out in this paper prompted the passage of a resolution by the society in which the inadequate instruction in obstetrics in the medical schools of the United States was acknowledged, and attention called to the necessity of according to the teaching of this subject an importance equal to that given to medicine and surgery. In view of the local midwifery conditions it was also urged that the extension of outdoor dispensary and hospital obstetric facilities be advocated as one of the most efficient measures for doing away with maternal complications and infant mortality as the result of midwifery practice. Further papers on this subject seem to confirm the necessity for a more radical treatment of the same. The problem in this country has many features which are different from the conditions met with in European countries with which our systems are often compared, and the necessity of extending the out-door services of our obstetric hospitals seems to be one of the most efficient methods for obviating the difficulties associated with midwifery practice. A paper on "Schools for Midwives," by Dr. S. Josephine Baker of New York, met with extended discussion, but the conclusions arrived at were by no means satisfactory. It is quite evident that the

problem will need greater attention on the part of the profession as a whole before any satisfactory solution can be arrived at. The conditions under which we live are so entirely different from those which pertain in foreign countries that a transference of their methods is hardly possible, and in order to solve the problem it must be attacked from an entirely different standpoint. Its solution at an early date is practically impossible, for like other similar problems, it must be solved by evolutionary, rather than revolutionary, methods.

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## BRIEF OF CURRENT LITERATURE.

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### DISEASES OF CHILDREN

**Treatment of Inguinal Hernia in the Nursling.**—Sawariadu (*Jour. de méd. de Paris*, June 15, 1912) says that the method of choice in the treatment of congenital inguinal hernia is immediate operation. Although the smallness of the parts renders the operation somewhat difficult still it may be done easily by the method of Lorthioir. This is a very simple operation. It consists of a simple straight incision 2 centimeters in length, separation of the subcutaneous tissues, luxation of the testicle, which draws the hernia and the cord aside, incision with a bistoury of the envelopes of the cord, isolation and resection of the sac without previous ligation, and suture of the skin, or closing the wound with a pin. The author prefers the suture. Healing occurs almost immediately by first intention. A perfect result is obtained with a very small percentage of cases of recurring hernia. Of course a cure may be obtained in many cases by the use of a truss worn day and night; but it is very difficult to keep it in place perfectly in so small a subject, and the location prevents perfect cleanliness. It is uncomfortable for the child. As soon as the operation is completed the attacks of indigestion and pain cease and the digestion becomes perfect. Mortality is nil, and the author has operated on a very large number of patients by this method with success. The operation lasts about ten minutes, sometimes less.

**Management of Asthma in Children.**—Basing his opinion upon the study of twenty cases, H. M. McClanahan (*Amer. Jour. Med. Sci.*, 1912, cxliii, 836) says that the majority of infants and children suffering from asthma, ultimately recover. The writer has recently received reports from ten cases that had been under his care in past years. In eight cases there had been no return of asthma, and in the other two the paroxysms were lighter than in former years. The frequency and severity of the paroxysms can in a large measure be controlled by proper care and treatment. A limited number develop an emphysema, and as a result their general growth is permanently impaired. This is the most



serious sequel of asthma, and because of this, all cases should receive prompt treatment, with a view of lessening the severity and frequency of the paroxysms. The general care of asthmatic children is important, because in most cases a careful study will reveal some exciting cause that can be removed, or some morbid condition, as constipation or indicanuria, that can be corrected. Generally a low meat diet with a high vegetable proteid is of value. In cases induced by intestinal trouble the diet should contain green vegetables and fruit juices. As the paroxysms are usually induced by an acute attack of bronchitis the first sneezing or coughing is an indication that the child should be put promptly to bed, have the diet restricted to liquid foods, and given an active cathartic to move the bowels freely. Medication will vary in individual cases, but hot drinks are always indicated. In certain cases a change of climate is essential. The writer firmly believes in a system of pulmonary gymnastics for asthmatic children. The mother is instructed to give the child daily exercises in deep breathing, at regular hours, with special emphasis laid upon the importance of complete expiration. This is particularly valuable in those children in whom there is a vesicular emphysema as a result of the asthma. These children should avoid running up hill, and all violent exercises. In these cases, an elastic binder, worn around the chest and held in place by means of shoulder straps, is strongly recommended. This should be tight enough to exert a constant slight pressure. For catarrhal bronchitis following the acute paroxysm, the writer advises sodium iodide, gr. ii-iv t. i. d., or syrup of hydriodic acid, mx-xx. For the paroxysmal attacks the drugs which will relieve one patient will be inefficient in another. Among those recommended are adrenalin hypodermically, morphine, chloral, nascent oxygen, and inhalations of steam with creosote and oil of eucalyptus, or of limewater.

**When to Operate in Permeating Mastoid Meningitis.**—J. W. Pike (*Practitioner*, 1912, lxxxviii, 875) says that incipient brain symptoms are not conclusive as to the hopelessness of mastoid meningitis, and if drainage can be established before wide infection has taken place, there is a chance of giving relief. An exploratory operation has no special dangers and is indicated in a child who has had attacks of ear-ache, and probably a recent one, who complains of headache, and seems listless and lethargic, with perhaps a slight rise of temperature and a tendency to sickness, and possibly some obscure tenderness over the mastoid process. Tenderness must not be depended upon as a constant symptom. It is more likely to be present when pus is approaching the surface, and the cutaneous nerves become irritable. In cases where it has been marked, the writer has generally found somewhat extensive caries; while in the permeating type, the presence of pus has been almost limited to the antrum. In any case in which one has even slight reasons for fearing brainward extension of infection, one should without delay mention to the



friends of the patient the possible dangers ahead and the desirability of exploration. It is useless to operate upon moribund patients, and practically hopeless to do so when general basic meningitis is fully declared. The only reason for exploring in the latter instance is that drainage of cerebrospinal fluid may relieve tension, and that there may possibly be a localized abscess. One can only offer operation in these cases as a forlorn hope, but if able to bear exploration they are rendered no worse in consequence of it, and the disordered brain-function makes it a matter almost of indifference to the patient. In these cases the writer would suggest operation, with fair explanation of the slender chance afforded, as long as the patient appeared to be in an operable condition.

**Prognosis of Diphtheria.**—The points to observe, in the order of their importance, in estimating the prognosis of diphtheria are given by A. Harris (*Practitioner*, 1912, lxxxviii, 878) as follows: 1. Heart sound. 2. Position of the cardiac impulse. 3. Pulse. 4. Area of cardiac dulness. 5. Extent of surface affected by the membrane. 6. Amount of albumin, and amount of urine passed in the twenty-four hours. 7. Smell of the breath; marked fetor is an unfavorable sign. 8. Color of the membrane; a dark membrane being of evil import. 9. Occurrence of hemorrhages from any mucous membrane or under the skin; small petechiæ are of very grave import. 10. Marked enlargement of the cervical glands. 11. The occurrence of certain other symptoms, such as vomiting, abdominal pain, restlessness, etc., which are very serious signs. Vomiting occurring to any extent within the first twelve days often betokens a fatal issue, and it is almost invariably associated with altered heart sounds. The following alterations in the heart sounds may be met with in diphtheria, marked in the order of their gravity: (a) Marked irregularity of the sounds associated with reduplication of the second sound (best heard at the apex). The rhythm and the general nature of the sounds correspond very accurately to the noise heard when a horse gallops. These sounds are often heard in the so-called vomiting cases, but they have been heard, in several instances, in which no other symptoms presented themselves. The prognosis is very grave. There is always dilatation and displacement of the apex beat. (b) Both sounds of equal duration, neither of the sounds being accentuated. The sounds are generally shorter than normal, more especially the first sound. They nearly approach the sound made by a watch ticking. The apex beat is generally displaced, but not to the same extent as in (a) and the prognosis is not so grave. (c) Softening (sometimes almost inaudibility) of the first sound and accentuation of the second sound. This condition is often associated with paralysis of the palate. Patients generally recover from this condition, although the convalescence is slow. (d) The occurrence of various murmurs of which mitral systolic is the commonest. That this condition is not that of endocarditis is shown

by the gradual disappearance of the murmur. It is really of minor importance, not allow these cases to get up until the 28th day of the disease. The murmur often takes eight to ten weeks to disappear.

**Uselessness of Dressings After Many Aseptic Operations, Especially in Children.**—Coville (*Presse m<sup>d</sup>l.*, June 8, 1912) has found it feasible to dispense with packing and other dressings after operations for hernia in children, appendicitis, undescended testicle, hypospadias, and phimosis. He always operates with rubber gloves, and in a thoroughly aseptic manner. In practice he has found that dressings are very difficult to arrange and keep aseptic in these localities, especially in children, and that they frequently become soiled with feces and urine, and are worse than no dressing at all. In children he has applied in fifty cases with success the following method: He dresses the child after the conclusion of the operation in a shirt that has been sterilized, and by pinning front and back together between the legs he prevents the child from inserting his hands to soil the wound. When the child must urinate or pass feces it is simply necessary to remove the pins, and fold the shirt inward so that its internal surface does not touch any unsterile substance, before the garment is replaced. He has operated successfully in this way in fifty cases, securing union by first intention, and finds that there are no inconveniences to this method. He disinfects the operative field with tincture of iodine before the operation. The child is much more comfortable and less restless than when dressings are kept in place for several days. The skin is more normal, its color better, and crusts are less frequent. Repair and the return to normal are very rapid.

**Congenital Luxation of the Hip as a Result of Epiphysitis at a Very Early Age.**—Carle Roederer (*Jour. de m<sup>d</sup> de Paris*, June 22, 1912) describes a floating form of femur, caused by epiphysitis occurring in a very young infant and resulting in a form of apparently congenital luxation of the hip, which is peculiarly hard to relieve, because the abscess which has occurred has caused complete destruction of the head and neck of the femur. When the child attempts to walk, which he does very very late, it is found that he has apparently no support in the hip-joint on that side, and there is a very bad limp and much shortening of the leg. Attempts to cause a pseudarthrosis by the use of plaster in a child who was being treated for Pott's disease resulted in no apparent benefit after the plaster had been applied for four months. The walk is "plunging," and no head of the femur can be felt, the trochanter rising with every step, the acetabulum not being in use, and the articulation very lax indeed. In the author's case the neck had almost disappeared, the femoral epiphysis, shaped like an interrogation point, was displaced laterally, and there was no contact with the acetabulum. Orthopedic operations are valueless in such a case, and apparatus is also of slight benefit. The condition is practically incurable.

**Pneumococcal Peritonitis in Children.**—H. C. Cameron (*Brit. Jour. Child. Dis.*, 1912, ix, 258) states that in childhood the only common forms of peritonitis besides pneumococcal peritonitis may be said to be those due to appendicitis, to gonorrheal infection, and to streptococcal infection. Gonorrheal infection may be readily detected by an examination of the vagina and vulva and by a bacteriological examination of the discharges. So-called "primary" streptococcal peritonitis is rare, but can hardly be distinguished from that due to the pneumococcus. In both it is commonly a complication of septicemia. It results sometimes from infection of the umbilical cord in the newly born; occasionally it follows scarlet fever or terminates chronic nephritis. Rarely it complicates erysipelas in young infants, when it may be associated with edema of the lower extremities. Youth of the patient, onset with rigors, convulsions or herpes labialis, early appearance of delirium or of pronounced diarrhea, the simultaneous presence of pleurisy, pericarditis or pneumonia, the history of repeated attacks of lobar pneumonia, evidence of antecedent colitis, great and rapid exudation of fluid into the peritoneal cavity, high temperature at the onset, marked leukocytosis, and want of localization of pain and rigidity to the right iliac fossa point to pneumococcal peritonitis rather than appendicial. The treatment of pneumococcal peritonitis commonly advised is by immediate laparotomy and the establishment of drainage. Against this procedure as an invariable practice the writer urges the following objections: (1) In pneumococcal peritonitis there exists no focus of infection which can be extirpated as in appendicitis. (2) The peritonitis is always in the first instance a diffuse general peritonitis involving the whole peritoneal cavity to its furthest recesses. Such a general infection renders efficient drainage almost an impossibility. (3) It is by no means certain, even if it were possible to drain off the exuded lymph, that it is wise immediately to attempt to do so. (4) The disease in the early stages is essentially a septicemia and the danger is in proportion to the virulence of the general infection. It would appear that the cases of peritonitis which recover are those which pass successfully through the pneumococcal septicemia. Of the writer's twenty-four cases, none recovered as a result of immediate laparotomy without the formation of residual abscesses and without the necessity for a second operation. In most cases the better plan is to wait, to place the patient in a sitting posture, to apply ice to the abdomen, to give morphia, and to endeavor to combat toxemia by saline infusion. The choice of the time for operation is a matter requiring the nicest judgment. In many cases at the end of the second week or in the third week the curve of the temperature chart will show a change, and the high continued pyrexia will be replaced by a remittent or intermittent fever. When this occurs a daily examination should be made for evidence of a subdiaphragmatic abscess.



**Dermatomyositis in a Child.**—Dermatomyositis, says F. E. Batten (*Brit. Jour. Child. Dis.*, 1912, ix, 247), is a rare condition, especially during childhood. Its pathological features are described as a cell infiltration of the interstitial tissue with a degenerative condition of the muscle-fiber. The muscle-fibers are in part destroyed by edema, in part by a leukocytic infiltration. The infiltration is most marked in the region of the vessels. The symptoms of a dermatomyositis may shortly be stated as follows: There is swelling of the extremities due to the inflammatory edema of the subcutaneous tissue and muscles, acute pain, muscular rigidity, great tenderness on pressure, and an erythematous rash resembling erysipelas situated over the affected muscle. The character of the rash may vary to a very great extent; it has been described as resembling urticaria, erythema nodosum, or purpura. The onset of the disease is gradual, there is a moderate rise of temperature, rigors are absent. When the acute stage passes off, the skin is left in an indurated and inelastic condition, and the muscles are hard and contracted. The writer records a case in a girl who died when about ten years old after an illness of fifteen months. The positive signs upon which the diagnosis was based were the character of the affection of the skin, the concomitant affection of the subjacent muscles, the periodic attacks of acute swelling of muscles and redness of the skin, and the subsequent induration of the skin and muscles after the subsidence of the acute attacks. The negative signs were the absence of any evidence of affection of the joints, of the blood, of the viscera, or of the nervous system, and in addition to these the absence of any sign of syphilis, tuberculosis, trichiniasis, and any form of organism capable of being cultivated on the ordinary media. At autopsy the changes found were limited to atrophy of the skin, fibrous replacement of subcutaneous fat, and degeneration of the muscles, especially in their superficial portion. Those parts of the muscles which are separated from the subcutaneous tissues by a thick tendinous sheath escape affection, while those muscle-fibers which lie in close contact with the subcutaneous tissues and along the intermuscular septa are liable to be affected. Perivascular infiltration of the vessels with small round cells is a striking feature, as is also the thickening of the walls of the vessels and in some cases the actual obliteration of the vessels. Infiltration of the muscle-fibers with lymphocytes also occurs, and gives rise to the occurrence of "lymphorrhages." These occur for the most part in close connection with the vessels, but a few such lymphorrhages can be found which do not appear to have any direct connection with the vessels. The change in the muscle would seem to be due partly to edema and partly to the cutting off of the blood-supply to the fibers.



# THE AMERICAN JOURNAL OF OBSTETRICS

AND

## DISEASES OF WOMEN AND CHILDREN.

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VOL. LXVI.

NOVEMBER, 1912.

NO. 5

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### ORIGINAL COMMUNICATIONS.

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THE END-RESULTS WITH VARIOUS OPERATIVE  
PROCEDURES FOR PROCIDENTIA AND EXTEN-  
SIVE CYSTOCELES PRIOR AND SUB-  
SEQUENT TO THE MENOPAUSE.\*

BY

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(With Five Illustrations.)

#### VAGINO-FIXATION OR TRANSPOSITION OF THE UTERUS AND BLADDER.

THE writer will first take up vaginal operations for procidentia with cystocele, in women approaching or past the menopause. The operation *par excellence* for this condition at that time of life is vagino-fixation, or what has been described within recent years as "transposition or interposition of the uterus and bladder." It may be of interest and perhaps of corrective value in the light of certain recent publications to give a brief sketch of the history of vaginal operations in this country for backward and downward displacement of the uterus. This is done in the interest of historical accuracy with no desire to raise the spectre of priority.

The first description of vagino-fixation or the Dührssen-Mackenrodt operation in this country was that given by the writer, in an article in the *Amer. Jour. of Gyn. and Obst.* for January, 1894. A fuller description was published by him in

\* Read by title before the American Gynecological Society, May 30, 1912.

the *N. Y. Med. Jour.* for Oct., 1895.\* The technic corresponded in all essentials to the procedure recently described by Watkins as "Transposition of the Uterus and Bladder."

From the outset the writer recognized the value of the operation in large cystoceles and in uterine prolapse of various degrees. In fact, on every occasion when the opportunity presented itself, he extolled the operation for cystocele and uterine prolapse in women after the menopause.

The first case of complete procidentia, in which he performed the operation, was in 1895, in a patient, who in 1908 (thirteen years later) became pregnant, the pregnancy being artificially terminated in the seventh month by another operator on account of morphinism. There had been no recurrence of the prolapse up to that time.

In a paper† published in the *Medical Record* for Sept. 6, 1902, the writer took occasion to state that vaginal fixation is "the ideal operation for cases of retroversion in women approaching the menopause, in which the retroversion is associated with a marked degree of prolapse and a marked rectocystocele." He had considered the operation so well established for these conditions that he took no further pains to bring it before the profession. He is, therefore, much gratified with the renewed interest it has excited under a new garb.

It is but fair that due credit be given to Dr. Thos. J. Watkins and Dr. I. Stone for emphasizing the value of the method in cystocele and prolapse after the menopause. In his first paper in 1899,‡ Watkins described a technic of suturing the vaginal wall to the broad ligaments and to the fundus, thus leaving the lower part of the body of the uterus exposed in the vaginal canal and reported three cases. This was a technic Freund had introduced and which soon met the fate it deserved, for a more unsur-

\* A suture is passed through the left vaginal flap at the extreme upper end of the incision, that is, from 1 to 2 cm. below the urethral opening and  $1\frac{1}{2}$  cm. from the edge of the flap. The suture is then carried through the anterior wall of the uterus, as near the fundus as it is possible, and out through the right flap at a corresponding point to that of the opposite side (The Technic and indications of Vagino-fixation, *N. Y. Med. Jour.*, Oct. 27, 1894). Then again, the first fixation suture is carried through the anterior aspect of the uterus about 1 cm. below the insertion of the tube, and is passed through the vaginal flaps near the urethral opening. (Trans. Med. Soc. of the State of N. Y., at its annual meeting, 1896) compare Fig. 8, Transposition of the Uterus and Bladder, Thos. J. Watkins. The AMER. JOUR. OF OBST., Feb., 1912, p. 233.

† Vaginal Operations for Retroversion and Retroflexion, etc. *The Med. Record*, Sept. 6, 1902.

‡ The treatment of Cystocele and Uterine Prolapse after the Menopause, *Amer. Gyn. and Obst. Jour.*, 1899, p. 258.

gical procedure could scarcely be conceived. In 1906 a second paper appeared by Watkins (*Treatment of Cases in Extensive Cystocele and Uterine Prolapse, Surgery, Gyn. and Obst.*, vol. ii, 659), in which the technic described resembled in the main features that of vagino-fixation as practised by the writer, with the exception that he did not carry the incision so far up in the anterior vaginal wall. In Watkins' latest and most extensively illustrated article (*Transposition of the Uterus and Bladder, AMER. JOUR. OBST.*, Feb., 1912) the incision in the anterior vaginal wall and the placing of the sutures in the uterine wall, correspond closely to that described by the writer in 1894, (*The Technic and Indications of Vagino-fixation, N. Y. Med. Jour.*, Oct. 27, 1894), as already stated.

The technic of the operation has been so often, fully described and illustrated by the writer and others, that to describe it now would merely take up unnecessary time and space.

There are a few points, however, in the technic to which the writer would wish to draw attention. In extensive cystoceles, he deems it essential, in order to obtain a good permanent result, to separate the bladder freely medially and laterally from the cervix and base of the broad ligaments. To accomplish this the "bladder pillars" have to be severed between two ligatures. To merely separate the bladder in the median line as advised by Watkins and others, invites a recurrence of the cystocele at the outset, for it leaves pockets of the prolapsed bladder at either side of the cervix, which, in a short time, increase in size and form what might be called a double cystocele. The writer deems it important also, with a very few exceptions, to perform a high amputation of the cervix, for when this is not done the cervix acts like a wedge and a recurrence of the prolapse is very prone to occur. The omission of this procedure by Watkins in most of his cases would, no doubt, explain the large percentage (5 to 10 per cent.) of recurrence of the uterine prolapse he has encountered. In a few cases where the uterus was very large and thick the writer has excised a wedge-shaped piece from the body as has been done by Pfannenstiel, Landau, Stoeckl, Lowit and others, but the procedure did not appeal to him. In such conditions he prefers to do a subtotal excision of the uterus leaving as much of the lower segment of the uterus, as possible, together with the cervix, and employing this residue of the uterus as a *pelotte* for the bladder by suturing it to the vaginal wall, as near to the urethral meatus as possible. During the past year he has carried out

this procedure in three cases with very gratifying results. They are not included in the series given below, as sufficient time has not yet elapsed to judge of the permanency of the results. In all of the cases a posterior colporrhaphy was done with the purpose of suturing the levator ani together between the rectal and vaginal walls and remedying the existing rectocele and laceration of the perineum. A minor detail which the writer deems of value, is the insertion of a narrow gauze packing, pushed up on either side of the cervix, at about the level of the os internum. There is usually considerable oozing from these areas and the gauze checks it. Very disturbing hematoma between the vaginal wall and uterus with fever and breaking down of the suture line have been known to occur when this preventive measure was not taken. The gauze is removed at the end of twenty-four or forty-eight hours and as it occupied only the small space between two sutures the healing of the wound is not interfered thereby.

The operation should not be done in the childbearing period, on account of the risk of dystocia in the case of pregnancy. Should occasion arise for some good reason to perform it during that period, the patient should be rendered sterile, with consent of husband and wife, by proper ligation and excision of the tubes.

To comply with the condition of this symposium, to state only results of cases observed for two years or more, the writer has had to draw his material almost entirely from his private practice, as it has been nigh impossible to trace the hospital cases for so long a period. The number of cases he has been able to trace is forty-five. In not a single instance has there been a recurrence of the prolapse or of the cystocele. In three cases there was a recurrence of the rectocele about 1 1/2 in. above the posterior commissure showing either a faulty technic in the posterior colporrhaphy, in that the denudation was not sufficiently wide at the upper part, or, a too early absorption of the deep catgut sutures. Latterly, the writer has employed chromicized catgut for these sutures.

#### VAGINAL OPERATIONS DURING THE CHILD-BEARING PERIOD. VAGINAL SUTURING OF THE ROUND LIGAMENTS.

In 1895, one or two years after vagino-fixation had been introduced, several cases of serious dystocia were reported in the German Medical Journals, due to the operation. Although the writer had not observed any such difficulties in two cases of



labor, that occurred in his series of cases of vagino-fixation, he did not feel himself justified in continuing with the procedure in women during the child-bearing period. Accordingly, he turned his thoughts to devising a technic which would offer no obstacles, in the event of pregnancy and labor. Having had considerable experience with the method of suturing the round ligaments to the abdominal wall and knowing its freedom from complications, both during pregnancy and labor, he argued the same freedom should obtain with a similar technic through the vagina, substituting the vaginal for the abdominal wall.

This technic he first carried out on Feb. 4, 1896, and described it in a short paper read before the Obstetric Section of the N. Y. Academy of Medicine, on Feb. 27, 1896 (*Medical News*, March 14, 1896).

Wertheim following the same line of reasoning drew a similar inference and at the end of a long article on dystocia in vagino-fixation in the *Centb. f. Gyn.*, Jan. 11, 1896, made the following statement: "Perhaps these facts (the absence of dystocia following Olshausen's method of ventral suspension, that is, suturing the round ligament to the abdominal wall) would argue in favor of a corresponding modification in vagino-fixation." It was not until March 7, 1896, that an article by Wertheim appeared in the *Centb. f. Gyn.*, describing the technic and reporting two cases in which it had been carried out. Five other cases were reported but a different technic was followed.

Bode in an article in the *Centb. f. Gyn.* for March 26, 1896, described a vaginal operation for folding and suturing the round ligaments upon themselves. Thereafter the various procedures for the employment of the round ligaments by the vaginal route for correction of uterine displacements were known in Germany as the Wertheim-Bode operation.

Shortly after the appearance of the writer's article, Byford\* and Goffe† each presented a paper describing a vaginal operation whereby the round ligaments were sutured either by folding them upon themselves or suturing them to one another or suturing them to the uterine cornua. As not infrequently happens, the work done in this country in devising and perfecting the technic of employing the round ligaments through the vaginal route was totally ignored in Germany.

Attention is drawn anew to these facts as it would seem, from

\* *The American Gyn. Jour.*, June, 1896.

† *Trans. Amer. Gyn. Soc.*, 1897.

recent publications that even our own Fellows have either overlooked or forgotten what their Fellow members have done in this line of work.

Although the operation under consideration was originally devised, chiefly for the correction of backward displacements, it was soon recognized that it had a field, as well, in downward displacements associated with large cystocele. Accordingly, in a paper presented by the writer to this society at Washington, D. C., May 2, 1900,\* we find in the fifty tabulated cases, five cases with marked prolapsus uteri and large cystoceles. In a number of other cases it is stated there was prolapse of the uterus of the first degree. These are excluded from the present discussion.

The writer has made the following indications for himself in the performance of this operation. Apart from backward displacements, he resorts to the operation in patients during the child-bearing period, when there is a marked cystocele accompanying the downward displacement and when, for some reason an abdominal operation is ruled out. The ruling out of the abdominal operation may be on account of marked obesity of the patient or on account of great fear on the part of the patient of a ventral incision. It is with him, therefore, an operation of selection and not of preference. In view of the time that has elapsed since the last paper it may be well to briefly redescribe the technic with the aid of fresh illustrations.

I. Incision same as for vagino-fixation (Fig. 1). Blunt dissection of vaginal flaps from the underlying bladder. The manner of doing this is immaterial, whether one makes a small transverse incision over the cervix and inserts the point of the scissors and with them effects the separation, or uses the scalpel for the vertical incision from near the urethral meatus down to the vaginal portion and separates the flaps on either side with short strokes of the scalpel aided every now and then with the gauze-covered finger.

II. Separation of the bladder from the anterior surface of cervix and lower uterine segment. This, as a rule, can be done with gauze and the finger, using the scissors here and there to sever the connecting tissue. As at this period of life, the prolapse of the bladder, as a rule, is not as extensive laterally as after the menopause, the separation need only be done in the median line and the "bladder pillars" may be left intact.

III. Opening the peritoneum (Fig. 2). This is easily accom-

\* *Amer. Jour. Obst.*, 1900, vol. xcii, no. 2.

plished by catching hold of the loose peritoneum some distance beyond the level of the os internum and with scissors making the incision the necessary width. The writer has witnessed many operators create for themselves unnecessary difficulties just in

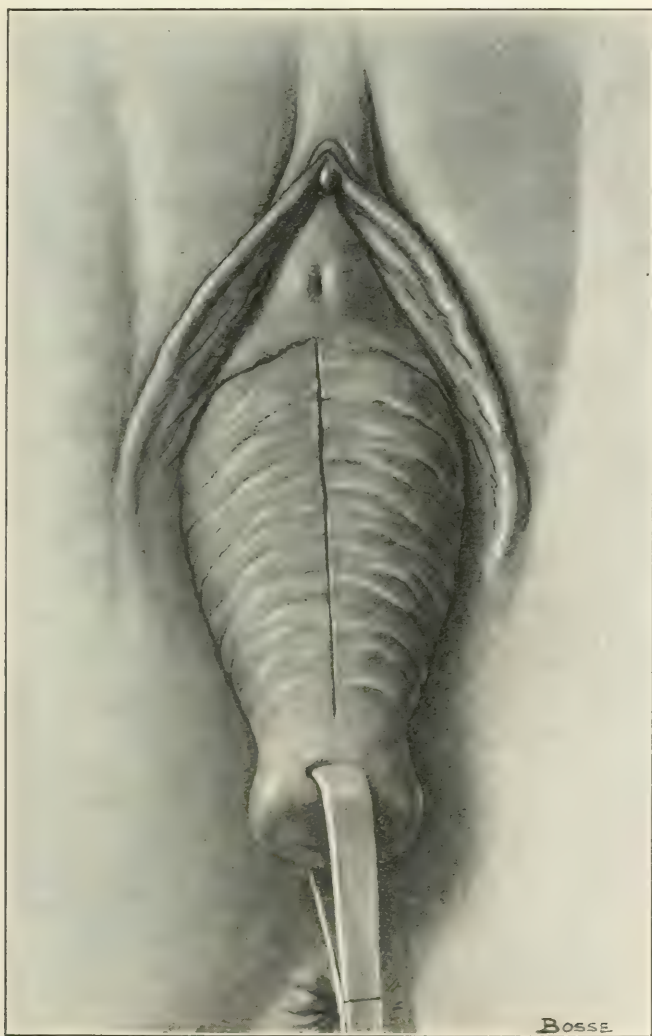


FIG. 1.—Longitudinal incision through the anterior vaginal wall.

this step. They would mistake the layer of loose cellular tissue between the bladder and cervix for the peritoneum, begin cutting into this causing troublesome bleeding, and, continue excavating

in this plane and sometimes fail entirely to enter the peritoneal cavity. All this can easily be avoided by not making any attempt to enter the peritoneum until the bladder has been fully separated



FIG. 2.—Transverse incision through the vesico-uterine peritoneal fold after the vaginal wall has been dissected away from the bladder and the bladder pushed up out of the way as in vaginal hysterectomy.

from the uterus. Then a retractor is placed in the space between the bladder and uterus and the thin peritoneal layer covering the anterior wall of the uterus, is freely exposed and is easily seen.



The remainder is very simple. A suture is carried through the peritoneum above the line of incision and left long in the bite of artery forceps. Its purpose is to locate the distal edge of the

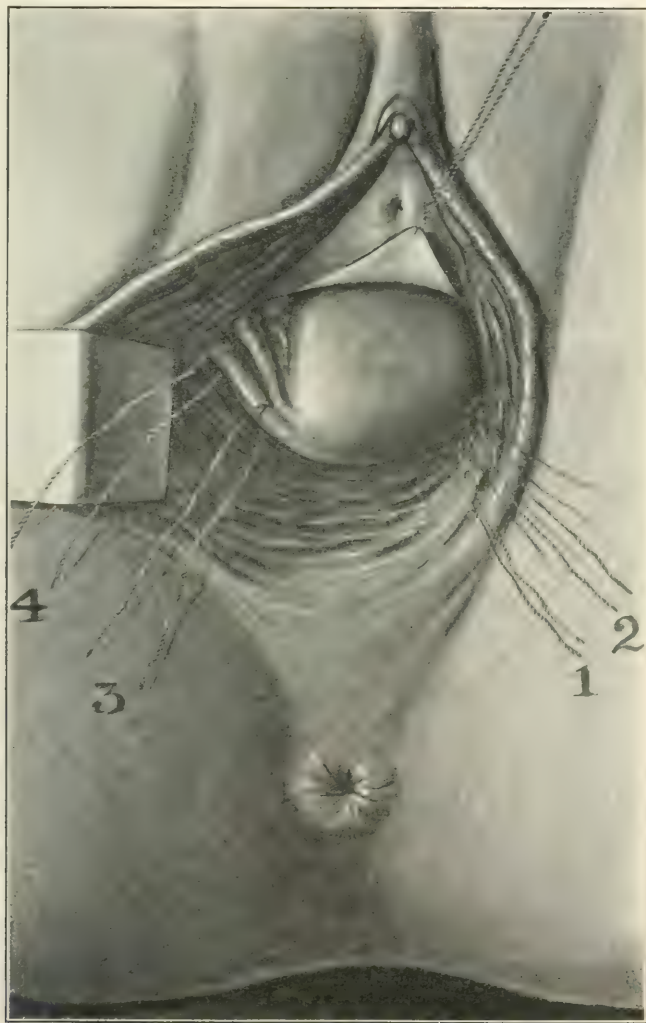


FIG. 3.—The fundus delivered through the vaginal incision and the sutures passed through the round ligament, two on either side. The sutures in the figure are not correct. They ought to be drawn as passing through the ligament much nearer the uterine cornua (view text).

peritoneum and to draw it down toward the cervix when it becomes necessary later to close the peritoneal incision.

IV. Delivery of the fundus through the vaginal incision. An endeavor should be made to do this by hooking the index-finger over the fundus and drawing it into the vaginal wound, while at

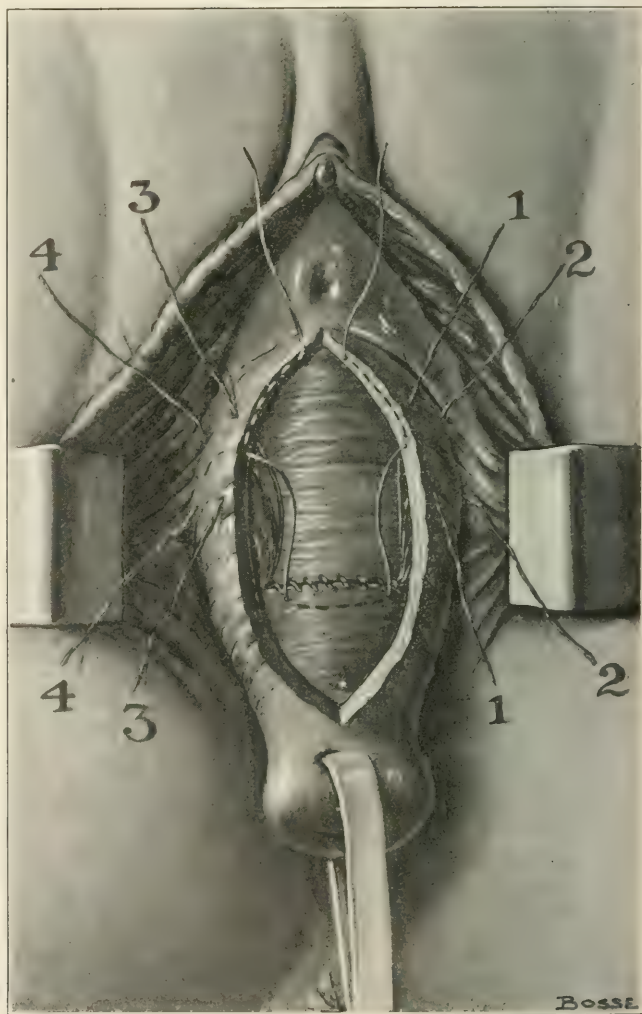


FIG. 4.—The round ligament suture carried through the vaginal flap on either side and the incision in the peritoneal fold sutured.

the same time, the cervix is pushed forcibly backward with the volsella toward the posterior fornix. This may fail if the body of the uterus be large and if the separation of the bladder has

not been carried to the full extent. Care is necessary in this step not to create any raw surface on the anterior aspect of the uterus. Therefore, if the above maneuver fails, one should make use of

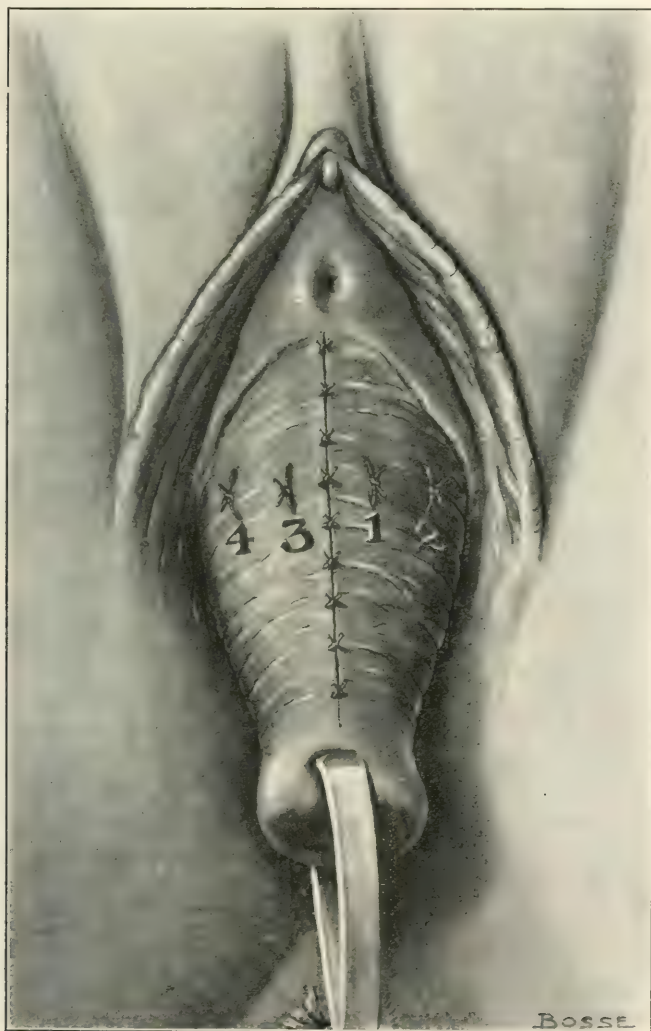


FIG. 5.—The round ligament sutures tied and the vaginal flaps brought together by interrupted sutures.

traction sutures, each carried higher up on the uterine wall until the fundus presents and is delivered. The adnexa are now visually inspected by the proper application of retractors and

can if necessary, be readily brought into the vaginal wound for any surgical procedure indicated.

V. Round ligaments sutures (Fig. 3). Before the uterine body is returned into the peritoneal cavity, two silk sutures are passed on either side, the inner one at the point of insertion of the ligaments in the uterus, and embracing some uterine tissue, the outer one penetrating the ligament about 2 cm. further out. To prevent confusion afterward, the ends of the sutures, in accordance with a preconceived plan, are attached by artery forceps to the surrounding drapery. The body of the uterus is then returned into the peritoneal cavity. A strip is now excised from each vaginal flap, corresponding in width, to the extent of the redundant vaginal wall, and the round ligaments sutures carried through the vaginal wall on either side at proper distance from the edge of the incision (Fig. 4). The bladder peritoneum is then drawn down by means of the guy suture and the peritoneal slit closed by a continuous catgut suture.

VI. Deep fascial suture of chromic catgut (the unnumbered suture in Fig. 4). This is an important suture and is passed as follows: the needle enters the fascia at the upper angle of the vaginal incision, where it is quite thick and plainly visible underneath the mucosa, it emerges, in the same plane, about 2 cm. lower down and is then carried through the anterior aspect of the uterus, a short distance above the os internum and is passed in a reverse direction on the opposite side, emerging at a corresponding point. When this suture is tied the entire uterus is elevated and a shelf created by the deep fascia and the lower uterine segment, which prevents a recurrence of the cystocele. When operating for cystocele alone, in the child-bearing period, that is, when there is no downward or backward displacement of the uterus, the writer does not open the peritoneal cavity and merely makes use of this suture. The two vaginal flaps are now coapted either by interrupted or continuous chromic catgut suture, the last couple of sutures being made to catch up the cervical tissue thus reproducing the condition that normally obtains.

Then the round ligament sutures are tied, not too tightly, and left long so as to be easily removed in the course of ten or twelve days.

The cervix is now amputated and sutured in the proper manner. The writer deems this an essential feature of all operative procedures for prolapse, as stated above.

Finally a posterior colporrhaphy is performed, and, if there be



a marked rectocele the parts are sutured so as to bring the levator ani together between the rectum and the vaginal septum.

Seven cases of marked prolapse associated with retroflexion have been traced, on whom the operation had been done, two or more years before. In one of the very early cases (June 27, 1897) the convalescence was complicated by a severe bronchitis, union of the vaginal wound was not good, and, although the uterus remained in good forward position, there was a recurrence of the cysto-rectocele. In a second case there was a slight protrusion, of the anterior vaginal wall when the patient was requested to bear down. In the remaining cases, the results were excellent, one patient went through a pregnancy and had a normal labor without any recurrence of the prolapse or cystocele.

Abdominal operation for procidentia during the child-bearing period.

The results the writer has obtained with a modification of Olshausen's method of suturing the round ligaments to the abdominal wall for backward and downward displacement of the uterus, have been so uniformly good that he has been content to employ it for the past fifteen years, to the exclusion of all other methods of round ligament operations through an abdominal incision.

As the writer has recently fully described and illustrated the technic\* he deems it superfluous to repeat it here. It is simple in its technic and is free from the infliction of any traumatism to the organs and structures concerned, and, as already stated, its results are uniformly good. Why anyone should think of employing another method when the round ligaments are called into requisition, has always been a source of surprise to the writer. It is the operation of preference with him in young women, who have only a few children or who are desirous of having more, independent of what number they possess at the time. If the uterine prolapse be associated with a cysto-rectocele, as is usually the case, the abdominal operation is preceded by a suitable plastic on the vaginal walls. In the presence of a marked cystocele, the same steps are followed as described above in the operation for suturing the round ligaments to the vaginal wall, with the exception that the peritoneal cavity is not entered and the uterus is not delivered through the vaginal incision. After pushing up the bladder above the fundus and excising the

\*Ventro-suspension by the Round Ligaments for Backward and Downward Displacement of the Uterus, *Surg. Gyn. and Obst.*, April, 1911.

redundant vaginal wall, the buried purse string suture, described above, through the thick fascia, at the upper angle of the wound, and below, through the anterior uterine wall just above the internal os, is applied. This technic corresponds to the modern one for hernia, which a cystocele virtually is. The contents of the hernial sac are pushed back and, a suture or sutures, are employed to bring structures together, which will act as a barrier to prevent the recurrence of the hernial protrusion.

Seventeen cases in private practice have been under observation for two years or longer. There have been three deliveries at full term, one patient had two children and another had one. The pregnancies, labors, and puerpera were normal in every respect. The women were examined afterward. In none of the seventeen cases has there been a recurrence of the prolapse, nor of the cystocele.

The writer believes, as is evident from the context of this paper, that the gynecologist should be familiar with various operative procedures for the condition under discussion and that he should exercise care and judgment in his selection of the cases suitable for each procedure. The specialist is only too prone to become a routinist and extoll a certain technic for every case of procidentia.

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## THE INTERPOSITION OPERATION FOR PROLAPSE OF THE UTERUS. "KOLPOHYSTERORRHAPHIA."\*

BY

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PROLAPSE of the uterus is not only a descent of the organ, but a complex or multiple disarrangement of several organs and other anatomical structures. The significance of uterine prolapse is therefore one of great import both to the patient and her physician because its very complexity has rendered its treatment one of the most difficult problems in gynecology. To look upon prolapse as merely a descent of the uterus (which weighs only 1 or 2 ounces) would in the light of our present knowledge appear very far short of a correct estimate of the actual condition.

\* Read before the Washington Obstetrical and Gynecological Society, January 12, 1912.

But this view was almost universal in the earlier days of gynecology, and if we may judge by some so-called methods of cure, is still prevalent in certain places.

Prolapse of the uterus is occasionally seen without the accompanying prolapse of the bladder, and *vice versa* the bladder may be completely free from the uterus, and in a state of prolapse. But we must remember that the presence of the bladder with its fluid contents, exerts a powerful influence in the development of a prolapse.

*The Essential Factors.*—The victim of a prolapse may have had in the days of her childhood the conditions necessary for future ptosis of the abdominal and pelvic organs. It is a well-established fact that enteroptosis is frequently a congenital rather than an acquired infirmity. There is moreover such frequent association between this condition (Glenard's disease) and pelvic displacement, as to attract the almost universal attention of gynecologists and those having opportunity to observe the developmental conditions of young women. The absorption of fat is often considered a predisposing cause of enteroptosis, but it should be considered one of the causes of the acquired variety only, for it has manifestly nothing to do with the congenital variety.

The connective tissue containing fat is the important structure so often found deficient. This is not only deficient in one quality but in all, for it may be so entirely absent, from traumatism, disease, or absorption by pressure, as to disappear in those regions within the pelvis about or near the uterus. It seems to have been overlooked by many that the broad ligaments, the chief sustaining force holding the uterus in position, are occasionally deficient in connective tissue. A stereotyped operation upon any ligament or set of ligaments, without *actual inspection* and examination, will occasionally bring failure for this reason. The reason for failure of former operations for prolapse was, first, they failed to realize that an additional intraabdominal pressure has exerted upon the uterus and bladder in certain cases of enteroptosis, and second, they failed in all vaginal operations to reach the firmly fixed fascia intended for the support of the uterus, bladder and pelvic peritoneum.

The result of operations upon the so-called pelvic floor often failed, so far as applied to prolapse. That is to say when done without other operative measures. With Emmet's ideal colpor-

rhaphy many patients were cured, the estimate being between 50 and 60 per cent. in competent hands.

The results of the great number of successful operations done by Emmet and his followers prove wonderful skill on their part when we understand that no apparent change was made in the supporting uterine ligaments, either in their length, their condition, or attachments. They were frequently left as before with the weight of abdominal viscera in displacement, and with nothing additional to sustain the pelvic organs in the new position but such support as might be developed in or near to the vaginal mucosa. In other words the operation consisted of narrowing the vagina, corrugation, cicatrization or compression by sutures of that portion of the pelvic fascia near the vagina, and under the bladder and which is indirectly attached at certain points to the pubic bones.

The unsatisfactory results in these operations were not alone the reason for divers other measures. We believe the medical mind began to understand the pathology of the question as well as to philosophize on its own account. The first marked gain in results was at the time many surgeons resorted to fixation of the fundus uteri to the abdominal wall. By fixation we do not mean suspension alone, but attachment of musculature of the uterus to that of the abdominal wall, *i.e.*, the recti muscles. This has never failed me, and I have not known of failures on the part of my surgical friends. But this success was not satisfying in all respects, for gynecology was begging the question when it gave over an operation intended for the gynecologist to the abdominal surgeon. It is also begging the question to remove the uterus for prolapse. Sims had his earliest gynecological experience with cases of prolapse and those of vesicovaginal fistulæ, and it should be a matter of pride on the part of every gynecologist to secure the best attainable results by the lower or vaginal route. These results are within the reach of every fairly competent gynecological operator, and in addition we cause less suffering and danger on the part of the patient.

To summarize them, we note the admitted failure of many of the former plastic operations for uterine prolapse, and that this condition is a complex condition, requiring either still more radical measures, or else a new disposition of the replaced organs which will render them less subject to the forces which have formerly induced the displacement.



If we adjust the pelvic organs, chiefly the uterus and bladder, in a position unfavorable to the direct force of intraabdominal pressure which is directed along a channel favorable to their descent and also utilize Emmet's principles as applied to the fascia, we may at least accomplish a gain over former methods.

This we think has been accomplished by the "Interposition Operation,"\* which has doubtless been evolved from Sängers operation for cystocele. It is as follows: The anterior vaginal wall is divided longitudinally from the cervix uteri to the meatus urinarius, and the bladder carefully separated from it and from the anterior surface of the uterus and to some extent laterally from the base of the broad ligaments. The fundus uteri is brought downward and forward and secured to the fascia under the arch of the pubis by two or more chromic gut sutures. These sutures are buried or at least they are so placed as to be covered over by the vaginal flaps immediately under the meatus. The anterior surface of the uterus should be thoroughly scarified in order to secure firm union between these surfaces and those of the vaginal flaps which are firmly united to it by additional chromicized catgut sutures. It is always necessary to excise a portion of each vaginal flap, before it is sutured to the uterus. If a cystocele has preceded the uterine prolapse, or if found a prominent feature in the protruding part we will find it necessary to excise the anterior vaginal wall still more freely, but our excision must not exceed a length sufficient to leave an anterior wall quite straight across and without protrusion or bulging.

When the anterior line of sutures are all placed, the uterus should be in full anteversion with the cervix pointing backward and the body lying immediately upon the vaginal wall with the fundus secured behind the symphysis pubis, and the bladder upon its posterior surface, and the urethra lying between the fundus and the symphysis. This position of the urethra is of great importance. Many of my patients have previously had incontinence of urine owing to the malposition of the uterus and bladder but have been relieved in every instance by the operation. As a consequence of the replacement we have described, some patients have required the catheter for several days after operation. The use of the catheter is not without its embarrassments, some of which will be mentioned later, and we urge the patient to void her urine immediately after operation or whenever she

\* Dr. Thomas Watkins of Chicago was the first in this country to practise this method, and very justly deserves the credit for priority.

can do so. Obviously the patient should not retain more than 8 or 10 ounces of urine in her bladder at a time during the first few days after operation, having in view her comfort and the security of the plastic work.

*The Perineum.*—The final step in this operation is to narrow the upper posterior vaginal wall and to build up a strong so-called perineum. This term, so much used by gynecologists, is not a definite one. We cannot here rely upon the Emmet operation alone, for we deem it wise to secure a very strong bridge or buttress instead of a normal perineum, so that additional support may be given the uterus and bladder. Especially do we aim to prevent the cervix from advancing below this new obstruction. Our method is to use a "split flap" here, with deep exposure of the fascia and such muscular fibers of the levator ani muscle as may still be utilized as of value in perineal or pelvic floor support. When the operation is completed the vagina will barely admit the index-finger, but it is quite its full length, although without the usual elasticity, owing to the presence of many sutures. I frequently operate with catgut as the only suture material, the chromic gut answering every purpose instead of tendon silk-worm gut or wire. It is but fair to add that complete vaginal closure is never necessary, for some of our most unpromising cases have been in large fat subjects requiring very radical work, yet these have had perfect results, and without extreme closure.

It is essential that nearly perfect asepsis be obtained before operation if we would have a normal postoperative recovery. There are few operations with greater opportunity for a certain degree of sepsis than this one. The procident uterus invites the entrance of infection and filth into its cavity chiefly owing to its proximity to the rectum. Since the proper method of sterilizing the vagina and the cavity of the body of the uterus with tincture of iodine, has been used in our hospital work, we believe it possible to have as normal a temperature chart in this as in other operations. We value the quick iodine method here especially because perfectly satisfactory sterilization cannot be accomplished until the patient is brought under anesthesia. The cervix is first dilated slightly and 25 % tincture of iodine slowly injected without great force into the cavity with a large glass syringe and retained there about two minutes. Every fold or corrugation of uterine mucosa is reached in this way, which is altogether problematical in any other manner. After the injection we will find prompt cervical contraction requiring gentle dilation with uterine

dressing forceps in order to allow the excess of the agent to escape. We also insert a tape of dry gauze if we wish to withdraw all of the excess fluid from the uterine cavity. These precautions are based upon the certainty that the tincture of iodine and other fluids may be forced through the uterine cornuæ and Fallopian tubes.

*What to Avoid at the Time of Operation.*—Many of my friends have said they feared injury to the bladder when dividing the anterior vaginal wall. This seems entirely unnecessary and groundless fear. The writer has never had such an accident. We take up the cystocele if present, form a transverse fold and cut through the entire thickness of the vaginal wall with one bite of the scissors. In fact we like the cases best which have a large cystocele, for which we cut down upon the bladder where it is easily seen, and can then roll it off from the vaginal wall and uterus without difficulty, whereas to begin the separation at the uterovaginal junction requires greater care to avoid injury to the organ.

*The Ureters.*—Some anxiety has been expressed as to the danger of injury to the ureters. We have not known of such a case either in the literature or in our own work. Anyone competent to perform a vaginal hysterectomy should have no difficulty in this operation; besides, the ureters are in greater peril in vaginal hysterectomy. Here there is no cutting or division of tissues in the region of the ureters. There is only blunt dissection with fingers and sponges.

*Care after Operation.*—Catheterization subsequent to operation is very important. The average nurse may, and probably will, make a simple matter a difficult one, and possibly do harm by introduction of the catheter into the vaginal wound instead of the bladder. The nurse must be shown how to introduce the catheter as the urethra is made to curve strongly upward and behind, not below the pubic arch. The catheter must be directed upward over the fundus uteri for the full length of the urethra before it enters the bladder.

*Care of the Bladder after Operation.*—The first urine after operation will often contain blood. At times the amount is small, or imperceptible to the unaided eye. The operator must always empty the bladder, and if necessary irrigate it at the close of the operation. Then the chart will show when the next catheterization is necessary. Usually, we find that the bladder in this, as in the Wertheim hysterectomy operation, requires irrigation



and treatment with a solution of 2 per cent. protargol, to prevent a catheter cystitis. In fact there is reason to believe that cases of cystitis develop after these operations when the catheter has not been used, although the catheter may not always cause mischief even when used by careless hands. It is best to take it for granted that the use of the catheter after these operations will cause a certain degree of infection, and that one should have frequent examinations of the urine made in order to detect the first symptoms thereof.

*Results of Operation.*—The German results obtained a few years since show 93.5 per cent. of cures while the best results of any other procedure give at best 70 or 72 per cent. In our experience of about eleven years with the operation we know of no failure. We have performed the operation only upon women who may not have children, and we unhesitatingly and strenuously oppose child-bearing in any woman having had such a disability as procidentia, even if operated successfully by any method. This method has been our sole reliance in all cases of prolapse and we have only resorted to fixation of the fundus to the abdominal wall with colporrhaphy when it was also necessary for some reason to open the abdomen above the pubis.

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## DYSTOCIA IN A CASE OF UTERUS DIDELPHYS.

BY

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(With One Illustration.)

IN the literature on uterus didelphys available in the New York Academy of Medicine it has been surprising to note how relatively infrequent at parturition the second uterus has caused dystocia necessitating operation.

In most cases described the nonpregnant uterus has offered no resistance. It has either risen spontaneously out of the pelvis or been pushed up manually at the time of delivery (Las Casas, dos Santos, Schatz, Wells, Pruvost).

Tauffer describes a case of uterus didelphys in which the second uterus caused considerable obstruction, the latter being overcome, however, in the course of a slow breech extraction. Pollak's case was similar as also was Stahler's except for injury in the case of the latter to the vagina which was septate. On



the other hand, in the case recorded by von Guerard, though delivery was by the vaginal route, version was unsuccessful and the fetus was delivered by craniotomy.

Two cases are described by Bettman and Loehlein respectively in which delivery by the vaginal route was less fortunate, resulting in the death of the mother. The cause in each case was rupture of the uterus.

Abdominal section though frequently employed in cases of pregnancy in the rudimentary horn has apparently only once been performed in uterus didelphys. In case 50 of Kehrer's series, abdominal section with Porro was performed at term, though the uterus was "*aeusserlich nicht zweigeteilt*," thus not a uterus didelphys but rather septus bilocularis. In this case both mother and child lived. In Tschudy's paper, referred to by Guerin Vamale, he describes the only case of Porro in uterus didelphys. Here the previous existence of hematocolpos and hematometra, which had necessitated operation, complicated the findings. Except that the sac containing the fetus was contractile and that meconium and water were passing from the vagina the case resembled tubal abortion as no second os could be perceived. The fear of uterine rupture led to Cesarean section which was followed by Porro. The child died on the second day from perverted metabolism due to long labor.

The case which I wish to report is No. 8005 of the records of the New York Infirmary for Women and Children. The patient came from Mt. Vernon and was first seen by the writer in the private clinic on Oct. 30, 1911; she was an American twenty years of age, physically healthy. Her aunt stated that she had always been mentally underdeveloped. She had menstruated regularly for six days every month since the age of fourteen. The date of the last menstruation could not be ascertained but she had had some nausea early in May and had felt movements early in August.

On examination the fundus was found 7 cm. above the umbilicus and 10 cm. below the xiphoid and the fetus was floating in vertex presentation. Internally the os was found to admit a finger tip; the diagonal conjugate could not be reached. There was the additional note of the existence of a tumor behind the cervix and attached to it. The tumor was movable and it seemed probable that it would rise out of the pelvis. The diagnosis was made of pediculated myoma of the cervix and the woman was told to return in two weeks for routine observation.

She was not seen, however, till December 8, when she returned to the clinic at 10 A. M. in labor. The external examination was as follows: oblique position; head in the right iliac fossa; heart,

r. u. q. Internally: os to the left, 1 cm. dilated; cervical canal obliterated. In the right side of the pelvic cavity the tumor presented and immediately to the right of the parturient os and leading into the tumor mass another opening could be felt. The tumor was considerably softened and gave the impression of a second uterus. Attempts at reposition were unsuccessful and Cesarean section seemed advisable.

At 1.30 P. M. the position was more nearly R. O. A. Patient was seen in consultation by Drs. Mary D. Rushmore and Caroline S. Finley. The head was more nearly over the brim of the pelvis, in consequence of which it was thought that the head might pass the tumor and it was decided to wait.



FIG. 1.—Left uterus removed by Porro operation.

At 7 P. M. as there was no advance of the head, Cesarean section was performed by Dr. Finley. The child and placenta were delivered through an incision between the level of the umbilicus and the pubis. After extraction of the placenta the uterus was brought out through the abdominal wall and was seen to have only a left round and broad ligament tube and ovary (see photograph). The other uterus had like attachments on the right and was entirely separate from the pregnant one. The ve;icorectal ligament described by Halban was not observed. To prevent dystocia at a future date the Porro operation was completed and a drain passed through the stump into the vagina. The abdomen

was closed in layers and the patient returned to room in good condition.

*December 9.*—Packing in vagina was renewed and a ragged mass of tissue  $3 \times 4$  cm. in size came away. The pathological diagnosis of this was "necrotic decidual tissue." This has been described by Schauta.

*January 1, Discharge Examination.*—Wound entirely healed; vaginally two cervixes are palpable, that to the right being much smaller and covered to some extent by a slight fold of vaginal tissue. Child a normal male infant.

*March 11.*—Patient came to inquire as to menstruation which had not reappeared though she was not nursing baby. Vaginal examination revealed the fundus to the right and anterior. In the vagina was seen a double crescentic fold of vaginal mucosa with an os on either side. On the left a sound goes in 2 cm.; on the right 8 cm.

*September 5.*—Patient has menstruated regularly since March and feels well.

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## ANEURYSM OF THE UTERINE ARTERY.\*

BY

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By the term aneurysm is commonly understood a well-defined sac directly continuous with the lumen of an artery. From the time of Galen a distinction has been made between aneurysms seeming to arise spontaneously and those resulting directly from traumatism. The former are the true aneurysms and the latter the false aneurysms. The chief anatomical distinction now made is that one or more tunics of the artery enter into the formation of the wall of the true aneurysm, while the wall of the false aneurysm is composed entirely of adventitious or perivascular tissue, except, however, that proliferated endothelial cells from the intima invariably line such cavities.

Among the recognized causes of true aneurysms two are universally considered of first importance, namely diseased conditions of the arteries due to syphilitic and other infections and poisons and increased arterial tension. False aneurysms are always of traumatic origin. These causes of aneurysms as well as others seem applicable in every way to the arteries supplying the uterus and its appendages. It is well known, for instance, that generalized arteriosclerosis does not spare the uterine arteries and in fact these arteries often show fibroid changes in advance of arteriosclerosis elsewhere, and that, even, during the fourth decade when the age incidence of aneurysm is greatest. Again the uterine vessels are subjected to great and often prolonged dilatations during pregnancy, parturition and in a variety of pathological conditions such as ectopic gestation and fibroid tumors. It would seem also that injuries to uterine blood-vessels during labor and more especially in the great variety of operative procedures so commonly employed in this region would be productive of innumerable aneurysms. It is therefore surprising to find that aneurysms of the ovarian and uterine arteries are among the extremely rare abnormalities met with in medical literature. A fairly careful search in the

\* Read at the meeting of the Washington Obstetrical and Gynecological Society, Dec. 12, 1911.



Surgeon General's Library shows reports of only one case of aneurysm of the ovarian artery and six cases of aneurysm of the uterine artery.

Whitmarsh(1), in England in 1867, observed at an autopsy, performed on a woman who died in about twenty-four hours after the appearance of the first symptoms of abdominal hemorrhage, a ruptured aneurysm of the right ovarian artery, the cavity of which was described as large enough to contain a small pigeon's egg. No other case of ovarian aneurysm is apparently on record.

Hewitt(2), in England in 1867, reported a case of fatal hemorrhage due to a traumatic aneurysm of the right uterine artery. A woman, thirty-seven years of age, who had previously given birth to seven children and had had one miscarriage, was delivered by forceps after prolonged labor. Four days after delivery the drunken husband got on the bed and knelt on the abdomen of the patient. She experienced a sharp pain at the time and sixteen days later had a violent vaginal hemorrhage. Several profuse hemorrhages occurred at intervals during the seventeen days following, at the end of which period or on the thirty-seventh day after delivery, she died. Autopsy showed a large abscess extending nearly to the right kidney and opening into the cavity of the uterus and an aneurysm  $1\frac{1}{2}$  inch in diameter communicating directly with the right uterine artery and projecting into the uterine cavity. The rupture of the aneurysm was clearly the cause of the hemorrhages. The walls of the aneurysm consisted of fibrin and exudate and showed no trace of arterial tissue. The author notes that the case appears to be unique.

Küstner(3), in Germany in 1890, reported a case terminating fatally which was clinically that of atonic postpartum hemorrhage but which was found at autopsy to have been caused by hemorrhage from an aneurysmal dilatation of an artery about the size of the radial at the placental site. The woman had had five children.

Mars(4), in Poland in 1891, published in Polish a report of which no translation seems available of a case of aneurysm of the uterine artery. From what I am able to learn of this case it seems that a woman forty-four years of age died from hemorrhage following childbirth, the cause of which hemorrhage being due as shown at autopsy to the rupture of a small aneurysm of the uterine artery. The condition was considered one previously unknown and undescribed.

Mundè(5), in New York in 1898, reported a case of aneurysm of the left uterine artery which was the first case of the kind he had met with in an experience of thirty years and which he considered after a search of the literature as of extremely rare occurrence. Mundè's patient was thirty-two years of age and the mother of a child eight years of age. Two years previously she was operated upon by another physician for an abscess which developed soon after the repair of a lacerated cervix. The abscess projected into the left vaginal vault and communicated with the cervical canal. It was freely opened by an incision which extended through the cervix from the sinus to the external os. A severe so-called venous hemorrhage caused by the incision was controlled by a tampon. The patient recovered promptly and remained well until about three months before coming under the care of Dr. Munde when she was made uncomfortable by a burning throbbing sensation in the left inguinal region. A diagnosis of aneurysm of the left uterine artery was made and subsequently confirmed by abdominal section. The condition was cured by ligation of the internal iliac artery with subsequent electrolysis as an added precaution.

Reymond(6), in France in 1908, reported a case of aneurysm of the right uterine artery with the comment that the condition was of interest on account of its rarity. In his case uterine hemorrhage following the menopause suggested cancer. Vaginal examination, however, revealed a pulsating mass in the right culdesac. On opening the abdomen a dilatation of the right uterine artery commencing near its origin and terminating near the fundus of the uterus was found. The aneurysm was about the size of the thumb and had the form of a crescent opening above. It was easily removed by dissection. Uterine hemorrhages ceased after the operation.

Vogelsanger(7), in Germany in 1908, describes a false aneurysm of the uterine artery, hemorrhages from which caused death twenty-seven days after labor. The patient was thirty-one years of age and the mother of three children. Hemorrhages at the beginning of labor suggested placenta previa. The presentation of the umbilical cord and also of a hand led the author to perform podalic version. The puerperium progressed normally until the eighth day when the patient on attempting to sit up had a profuse hemorrhage. A second severe hemorrhage followed five days later when the patient was resting quietly.

Three more hemorrhages occurred during the next fourteen days when a vaginal hysterectomy was performed, death following in a few hours. An examination of the specimen revealed an aneurysm of the cervical branch of the right uterine artery, 6 to 8 mm. in width and about 9 mm. in length. The sac consisted of a layer of fibrin and showed no internal elastic membrane and hence was a false aneurysm. The author believes that the aneurysm was produced by tearing of the artery in the first stage of labor.

In view of the rare occurrence of aneurysms of the uterine arteries I feel warranted in calling attention to a case in which fatal hemorrhage six days after normal labor was due to the rupture of an aneurysm of the left uterine artery. In reporting this case I would note that the patient who was unable to pay for a room in a hospital was twice placed in a free ward at Columbia Hospital and while there was under the care of Dr. J. Wesley Bovée.

The patient, a white woman thirty-six years of age, first came under my observation in November, 1908, when she was pregnant for the fourteenth time in fifteen years. Examination showed a lacerated perineum, an enlarged uterus and a laceration of the cervix which on the left side extended well up into the uterus. On January 1st 1909, when about four months pregnant she aborted.

The patient recovered promptly from the miscarriage and about ten weeks later was admitted to the free ward at Columbia Hospital where, on March 19, Doctor Bovée performed a trachelorraphy. I was present at the operation and made note that in excising the scar tissue on the left side brisk arterial hemorrhage was produced but which was entirely controlled by the first suture used in closing the wound. The patient made an uneventful recovery.

In June of that year she again became pregnant. During this pregnancy she enjoyed good health, the only complaint noted during the entire time being pain in the left thigh, which was recorded for the first time in December.

Labor began early in the morning of March 6. Pains were weak and rather infrequent until 3 P. M. when with two severe pains she gave birth to a live child unattended. From appearances twenty minutes later it was evident that she had had quite a profuse hemorrhage but not greater than often occurs in cases considered normal. Her pulse rate was 108. There was no evidence of external laceration and no further examination was made. The placenta was expelled spontaneously ten minutes later. At 8 o'clock that evening her pulse was 88 and the flow not excessive. The next three mornings, March 7, 8, and 9, she



was visited by a nurse of the Instructive Visiting Nurse Society who reported temperature, pulse and lochia normal. When seen about 7 P. M., March 9, she complained of pain in the pelvis and left thigh and said she had had a slight chill during the afternoon. Her temperature was 102 and pulse 104. The next morning, March 10, while the nurse was in attendance the patient had a sudden hemorrhage estimated by the nurse as about 500 c.c. Her temperature was 103 and pulse 120. When seen soon afterward she was given ergot and the nurse requested to remain in constant attendance. At 4 P. M. she had another severe hemorrhage. A vaginal tampon was soon afterward inserted and the patient transferred to Columbia Hospital.

The hospital records show that about 10:30 P. M., March 10, the patient expelled the vaginal gauze in a paroxysm of coughing and immediately following had a violent hemorrhage. The resident physician, Dr. Neill, promptly packed the uterus and vagina and administered usual treatment. The patient remained fairly comfortable throughout the day of March 11, temperature ranging from 99 to 100 and pulse from 110 to 130. At 9 o'clock the next morning hemorrhage became profuse notwithstanding the tampon. Repacking and stimulation were futile. She died a few minutes later.

Autopsy several hours later showed extreme exsanguination. The uterus and vagina were firmly packed with gauze after the removal of which a blood clot was seen to project from the left side of the uterus about 1 inch above the external os. No other pathological conditions were recognized save a small fibroid on the anterior uterine wall and there was no evidence of puerperal infection. The uterus and appendages were removed and a subsequent examination showed a sac about 3 cm. in length and 2 cm. in width continuous with the left uterine artery and communicating with the cavity of the uterus by an opening 2 cm. in length by 1 cm. in width. The sac appeared smooth and firm and contained a fresh blood clot. Microscopical examination of portions of this sac show dense fibrous tissue but no trace of an arterial coat. The sac is evidently a false aneurysm and it seems reasonable to conclude that it resulted directly from injury to the uterine artery in the operation for repair of the cervix one year previously. The rather profuse hemorrhage at the time of delivery may possibly have come from the region of the fibroid. The rupture of the sac probably occurred on the fourth day after delivery but it also seems possible that it may have occurred at the time of delivery, the hemorrhage being checked by the formation of a clot and the contraction of the uterus. If so, the chill and hemorrhage four days later were probably due to the softening



of the clot. The condition causing death was one scarcely to be anticipated and apparently could have been remedied only by an early hysterectomy.

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## HEART DISEASE IN PREGNANCY.

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A STUDY of the literature on this subject shows that pregnancy complicated by cardiac disturbances is a serious matter and it is therefore imperative to formulate a definite diagnosis and prognosis as early as possible. This can be done by carefully observing disturbances in cardiac compensation, and the object of this paper is to discuss the matter from this standpoint.

Although heart disease as a complication of pregnancy has always constituted a problem, the literature shows that comparatively little is actually known about this complication. Most writers go to the extreme in declaring that pregnancy with heart disease is a very serious condition, in which it is exceptional for the labor and the puerperium to follow a normal course, and in which sudden death during gestation, labor, or the puerperium is the rule. Among these writers may be included Guerard, Baranger, Feiss, Leyden, Zweifel, Ballantyne, Chadwick, Remington, Perret, etc.

On the other hand, Bondareff, Haymann, Backhaus, Gussarow, Riviere, Jacconi, Barnes, Gerhardt, Cohnstein, Larcher, Ducrest,

Birol, Macdonald, Letulle and Löhlein, do not admit that heart lesions have a prejudicial effect on pregnancy.

Jacconi and Phillips say that a simple milk diet will set everything right.

Müller treats extreme cases of broken compensation by massage of the cardiac region, with which treatment he has had great success.

There is a still greater diversity of opinion as regards details. Baranger and Clement describe a specific heart disease of pregnancy and Durosier has noticed cardiac hypertrophy in 135 cases on percussion. Riviere, Graves, Henning, Gleweke, Freund, Jr., and Dürr proved that severe gestational endocarditis does occur, while Fellner and others do not recognize a specific heart lesion of pregnancy and doubt whether gestation has any effect on heart disease, which accounts for the favorable prognosis they give in these complicated cases.

The fact that individual observers hold such different opinions makes it desirable to clear up this question as far as possible, for as a rule the patient's relatives demand a really definite prognosis in such cases.

My own experience is limited to the observation of sixteen cases, but in only eight of these are my notes of a reliable character. If we carefully investigate the particulars of cases as given by various observers, we find that the reason they differ so materially is that the writers do not differentiate between the various heart lesions. They ignore in given cases the connection between heart disease and pregnancy, and little reliance can be placed on the statements of one author who reported three sudden deaths out of five cases, while another had five deaths out of seven, and a third confined successfully all of 135 cases.

Bearing in mind our own and the numerous cases recorded in the literature of the subject, it seems practicable to divide cases of pregnancy complicated by heart disease in three main groups:

I. Those cases in which there has been recognized heart disease for some time before pregnancy occurs.

II. Those cases in which a latent heart lesion is made manifest through pregnancy.

III. Those cases in which pregnancy causes cardiac trouble of a functional nature and permanent arterial disorders ensue as a result.

Diagnosis and prognosis in the first group of cases do not present any difficulties. It is not necessary to know the patient's

previous history. We know in general that during pregnancy the blood is increased in quantity, and that regular serous congestion occurs. Under these circumstances it is only natural that the work of the heart should be greatly increased. This is partly due to the extension of the circulation into the uteroplacental vessels, so that the area of the work of the heart is enlarged from the gradual growth of the genital organs and their increased demand for blood. It may be asserted, therefore, that even a normally healthy heart may become hypertrophied when this temporary and gradually increasing demand is made upon it. This constitutes the normal reaction of a healthy heart, but it is indisputable that even a diseased organ is capable of healthy reaction, though the physical signs of the same may hardly be noticeable. I have not observed any superficial enlargement of the heart on percussion such as that claimed by Darozier. This may be due to the lack of skill on my part, although I have always believed myself fully acquainted with all the newer methods and technic of examination. There are other known factors, however, which enable us to diagnose this natural dilatation of the heart. It is a well-known physiological axiom that the pulse rate and its rhythm vary very much in different positions of the body. In a nonpregnant, healthy woman the rate of the pulse varies at various portions of the day according to mental conditions and emotions even in the same posture. In one patient I found that this difference in a day amounted to twenty beats per minute. The difference in the rate of the pulse in a lying and sitting posture, with perfect mental repose, may vary from eight to twenty beats a minute. But such variation in the pulse rate disappears entirely in the case of a dilated heart, a symptom first noticed by Graves and Jorissen. Graves, in fact, regarded it as the first symptom of pregnancy. It is needless to say that although at the outset of pregnancy hypertrophy does occur, it is so slight that at most it may be said to lessen the variation of the pulse rate, but not to do away with it. On the other hand, pregnancy or any other condition, such as new growths, etc., which throw permanent overwork on the heart, lead to hypertrophy. Jorissen's observations, therefore, are not satisfactory.

In formulating a prognosis in the case which follows, I was guided only by the presence or absence of the symptoms of compensation.

There is a general consensus of opinion that pregnant women

with heart disease do well so long as compensation is present, but if there is edema, dropsy, anasarca, cyanosis, dyspnea, or angina there is no doubt that the prognosis is bad and we are powerless to aid. However, there are cases in which this state of deficient compensation, artificial abortion or premature labor has lead to transitory improvement, but there are none in which interruption of pregnancy would have had a favorable influence on the compensation of the heart. Artificial abortion is usually accompanied by hemorrhage, and from the obstetrical point of view, interference is undesirable.

How far lack of compensation may be allowed to go in the initial stage without prejudicing the prognosis, it is not possible to say. The result will be favorable alike to heart and operation, if we recognize the lack of compensation in an early stage, and if need be, interrupt pregnancy sufficiently early.

The first stage of broken compensation commences when the hitherto hypertrophied heart begins to dilate. The necessity of dilatation is undoubtedly the first symptom of exhaustion of the muscular tissue of the heart, but one which under favorable circumstances may be overcome.

I believe that the most interesting point in my observations has been the ability to confirm the first stage of dilatation of the muscular tissue of the heart by the simple method of examining the pulse. Under systematic examination I found that pregnant women in whom variation of the pulse has ceased on account of hypertrophy of the heart repeatedly show a soft pulse whenever the heart begins to dilate. This frequent variation of the pulse is in direct proportion to the extent of dilatation of the myocardium.

In this article I wish to deal with the practical side of this question, and as the variations in the pulse are subject, even in healthy individuals, to many outside influences, I examined the pulse rate in several patients many times a day, and for a space of five or six minutes.

This table clearly shows that persons of different ages and in different stages of pregnancy show an average difference in the rate of the pulse of ten to fifteen beats. This difference is partly due to the state of the nutrition and partly to the postures in which the patients were examined.

I was only able to ascertain that the heart was hypertrophied in two of the four persons (Table II) before the reappearance of the variation of the pulse.



TABLE I.

Number of labour	Age	Month of pregnancy	Average rate of the pulse in		Difference	Pulse rate before pregnancy			During pregnancy		State of nutrition
			Erect posture	Horizontal posture		Before pregnancy	Heart	Want of compensation	Angio-sclerosis	Other affection	
II	22	V	98	80	18	78	mitral insuff.	present		none	good
I	28	IV	98	82	16	80		none	present		good
I	26	IV	94	84	10	80					poor
I	26	V	78	88	4	82					good
III	26	IV	80	96	16				present	none	good
III	28	V	90	78	22						good
II	19	IV	92	78	14	78					good
II	21	II	94	76	18	78					good

TABLE II.—THE PULSE IN PREGNANT WOMEN WITH HEART DISEASE.

Age in years	Number of labors	Before pregnancy	The pulse in the separate months of pregnancy								Diagnosis of heart disease	Symptoms of want of compensation	Course of labor
			I	II	III	IV	V	VI	VII	VIII	IX		
32	III	78-84	78-84	80	80	84	82-86	82-86	82-88	.....	Vit. cordis.....	Anasarcia. Edema...	In the VIII month premature labor. Living child.
29	III	82	82	82	82	82	86	84-90	84-90	84-90	Insuff. bicuspid...	Cyanosis. Difficult breathing. Angio-sclerosis.	Normal labor at term; sudden death.
22	I	80-84	80-84	80-86	80-86	90	90	94-98	94-98	98	Vit. cordis.....	Very pronounced anasarca.	Normal labor.
21	II	76-86	76-86	76-86	82	82	82	82	84	82-92 82-92	Mitral insuff.....	Edema, cyanosis. Angina attacks.	Delivery at term; a dead fetus; condition of heart very bad.
27	II	.....	100-114	100-114	90-114	.....	.....	.....	.....	.....	Mitral insuff. stenosis.	Frequent fainting; anasarca; hepatic congestion. Albumin in the urine.	Artificial abortion in the IV month. The heart symptoms improve.

A comparison between the figures in the fourth and seventh columns of Table I shows that the pulse rate was higher when hypertrophy of the heart was present than it was before. This table shows a difference of from eight to ten beats in the beginning in different positions of the body, and of eighteen beats later on. I venture to state that hypertrophy either does not exist or has disappeared when the difference is from six to eight beats, for with greater hypertrophy the difference goes down below ten beats, and there is a point at which it totally disappears. If during the course of a pregnancy a higher pulse rate is continually observed than before pregnancy, or in different postures, we must assume that dilatation is present, which is subsequent to the normal hypertrophy. In my cases this reappearance of the variation in the pulse beat was soon followed by other symptoms of broken compensation.

For example in two cases the preliminary symptoms were observed and were followed later on by anasarca, dropsy, and congestion of the liver, difficult breathing, and angina. At this stage the variation in the pulse rate greatly increased so that the initial difference of eight to ten beats became twenty-two to thirty in the horizontal and erect posture.

The difference in these figures is so marked that we may safely conclude that the increase in variation is in proper proportion to the improvement of the broken compensation, while it is in reverse ratio with the possibility of a favorable prognosis. In this advanced stage, dilatation of the heart is not ceable on percussion, and I repeat that even the earliest stages of dilatation may be confirmed in this way.

I have only had occasion to advocate the interruption of pregnancy on account of dilatation in a single case, for I have only recently become acquainted with the method of observation outlined above, but judging by past experience I venture to state that hereafter as soon as I notice the first signs of broken compensation in a pregnant woman suffering heart disease, I will adopt a severely observant attitude, and if the symptoms increase, recommend the interruption of pregnancy. I do not intend to wait until other signs of broken compensation develop and render the prognosis unfavorable.

The cases belonging to the first group are necessarily those in which compensatory hypertrophy of the heart merely lasts for a very short period, and in which the prognosis is comparatively

bad, although as the literature of the subject and my own observations show, even in cases in which heart disease was present before pregnancy, we should be patient and persistent in our observations, for it is possible that normal labor will follow in any of these cases. The following reports of cases appear on this point.

CASE I.—A iii-para, æt. thirty-two, the wife of a lawyer, had two normal labors in spite of mitral insufficiency. The only distressing symptom was profuse hemorrhage during gestation and the puerperium in consequence of the heart trouble. I did not see the patient until the fifth month of her third pregnancy. The patient was cyanosed, the breathing was short, the pulse rate high and there was edema of the lower limbs. The mucous membrane of the genital organs was unusually moist and of a livid dark blue color. On careful internal examination the trickling of blood increased. The external os was the width of two fingers, the internal completely occluded. The fetal movements were very active and distinctly felt. At consultation a diagnosis of mitral insufficiency with symptoms of advanced broken compensation was made.

On this account I recommended the induction of premature labor but the family and the practitioner in charge of the case declined operation because her two previous pregnancies had ended in normal labors. I was in disgrace with the family for months but the patient died immediately after parturition. The child was very much cyanosed and could not be resuscitated.

CASE II.—The second case was in a well-nourished ii-para, æt. twenty-six, who had suffered from mitral stenosis for six years. She consulted me for frequent hemorrhages in the third month of pregnancy, in June, 1895. In her first pregnancy a year and a half previously she gave birth prematurely to a macerated fetus. The patient said that during labor she became so blue and suffocated that her life was endangered. The heart lesion in this young and healthy looking woman had been compensated until this time. Loud endocardial bruit, great dilatation of the left ventricle, enlargement of the liver, increasing anasarca, albuminuria and blood trickling from the uterus pointed to the disease becoming worse and in this case likewise I advised the induction of labor. The patient consented and operation was arranged for the following morning when the patient's family doctor and my assistant would be present. The patient lived in the environs of Budapest, a journey of half an hour. She went home after the consultation to prepare herself for the operation. At 8 o'clock the next morning, as we were starting for the operation, I received a telegram from the patient's husband informing me of the sudden death of his wife. A postmortem was made which proved the correctness of the diagnosis. The cause of death was heart disease with extreme want of compensation and cardiac paralysis. In this case there was also present



an extensive fatty degeneration of the intima of the aorta, and of the myocardium.

CASE III.—A vi-para, æt. forty, the wife of a farmer. I was called in because the second stage of labor was very prolonged. The patient, who was extremely restless, cyanosed and edematous, had suffered from severe heart disease for many years. Hemorrhage had been going on for about four days, and though the pains were strong, the labor was not progressing and the membranes unruptured. On examination I found the cervix thick and succulent and the amniotic membrane still intact but as the latter was ruptured, delivery speedily followed and a well-developed girl baby was born. The third stage of labor passed off normally and the uterus subsequently contracted well. The puerperium gave no trouble until the tenth day, though all through the patient was very restless and often sat up in bed. She complained of burning pains at the heart. On the eleventh day her breathing was so bad that she got out of bed herself early in the morning to open a window which she was in the habit of having open. In doing this she collapsed with a sharp cry and died. No postmortem was allowed.

CASE IV.—A case of compensated mitral insufficiency in a v-para, æt. thirty-eight. In this case expectant treatment was adopted in the seventh month of pregnancy; rest, milk diet and heart tonics were prescribed. Labor took place spontaneously at the end of the seventh month and was normal in its course. There was profuse hemorrhage during the puerperium on the seventh and eleventh days, followed by uninterrupted recovery. The heart disease had, however, become worse so rapidly that a further pregnancy had to be forbidden and at that time, four years after the last labor, the patient had at intervals severe attacks of broken compensation and was quite incapable of doing any work.

CASE V.—A primipara, æt. thirty-six, who accompanied her husband, a traveller, from Dresden to Budapest when she was in the eighth month of pregnancy. She had had heart disease for many years, but said that she had always felt quite well. Slight hemorrhage came on during the journey and she consulted me in consequence.

My diagnosis was marked mitral insufficiency, enlargement of the liver, no apparent edema. The veins in the legs and in the genital regions were extremely varicose. Pulse eighty to ninety and rather hard. According to her own account she is in the habit of smoking strong cigars and drinking a good deal of beer. After a fortnight's rest in bed the hemorrhage ceased, the veins became smaller and the patient was able to get up. Within half an hour, however, after rising, labor pains suddenly came on, the liquor amnii escaped and a child was born, accompanied by very profuse hemorrhage. I found her lying on her right side in a room full of cigar smoke groaning and crying and the baby crying too, and still attached to its mother by the umbilical cord.

The cord did not pulsate. I tied it off and when the patient changed her position on to her back it was evident that the uterus had sunk down on the right side and the fundus was situated three fingers' breadth above the umbilicus. I had hardly begun a gentle Credé when a great quantity of blood escaped from the vagina in a thick stream bringing with it the placenta and membranes and followed by the collapse of the patient. By the help of the midwife who had arrived by this time we removed the great quantity of blood; after about two hours, in which auto-transfusion, injections per rectum of normal saline solution, heart stimulants subcutaneously, artificial respiration and fomentations, etc., were resorted to, the patient came to, the pulse improved and the uterus contracted well. This condition lasted until noon of the following day, when she was suddenly seized with extreme dyspnea, palpitations, fits of coughing and persistent blood spitting, acute dilatation of the left ventricle with a more rapid and weaker pulse. The stimulants given for strengthening the heart could not compensate the hyperemia of the lungs and the symptoms of pulmonary hemorrhage grew worse and worse until she died at 10 P. M. The child survived but is cyanotic and has symptoms of congenital heart disease. In spite of her friends' protests the patient had insisted on smoking ten cigarettes in the interval between delivery and her death.

I desire to add a sixth case which is worthy of mention because the induction of abortion in the early stage of loss of compensation was followed by rapid and complete return of this symptom.

CASE VI.—The patient was a primipara, æt. twenty-five, who lived in the country and came to me complaining of frequent and profuse hemorrhage. She had been married for five months and was suffering from constant palpitation, frequent fainting and was out of sorts generally. The last period was four and one-half months ago. On examination she was found to be four months pregnant. The external os was entirely occluded. During the examination a good deal of blood trickled from the mouth of the uterus which was very succulent; the genital organs were excessively cyanosed and the labia majora were full of varicose veins. The apex beat was found in the sixth intercostal space external to the nipple line and cardiac dullness extended outward beyond the right border of the sternum. The liver was felt to be about four fingers' breadth below the costal arch. There was edema of the lower limbs. The pulse was 90 in the horizontal position, erect 112, and on slight movement 130. There was no doubt that the heart was dilated and I called Prof. Tauszk in consultation and had the patient under treatment for sixteen days in a sanatorium. During this period hemorrhage practically never ceased, though it was less at times and the endocardial murmur became louder, while dyspnea and frequent fainting fits came on in bed and the patient's lips were

cyanosed. As the woman at best was ill-nourished and anemic, I suggested artificial abortion for the following reasons. 1. The increasing lack of compensation of the heart. 2. The uterine hemorrhage, not only as a sign of congestion but also of abnormal location of the placenta. 3. The four and one-half months' duration of the hemorrhage seemed to point to inevitable abortion.

Abortion was therefore induced with a dilator of my own device. On the sixth day after operation all symptoms of want of compensation had disappeared, though the heart affection was still present. When I saw the patient ten months later the symptoms of want of compensation had greatly increased. Prof. Tauszk examined her and at that time she was in the third month of pregnancy. I dilated the cervix and rapid improvement took place.

To the second group belong heart lesions which were present before pregnancy in a latent form, and which became active in consequence of the greater amount of work on the heart. By latent heart lesions Basch specifically refers to conditions preceded by arteriosclerosis of long standing. In this category must also be included other general disorders predisposing to heart disease, such as syphilis, polyarthritis, rheumatism, diabetes, and acute infectious diseases, including typhoid, malaria, pneumonia, influenza, pyemia, and gonorrhea. Excessive hemorrhage may also be included in this group.

While arteriosclerosis causes heart lesions by mechanical interference, certain infectious diseases bring about an involvement of the endocardium, while the general disorders referred to above induce it by an involvement of the nerves and muscles of the heart in the process. A chance incentive, such as pregnancy, is sufficient to bring about an exacerbation of a previous condition. In making a diagnosis it is important to realize that these heart affections during pregnancy may be present without giving rise to any evident cardiac symptoms sometimes for months. In one case the variation in pulse had persisted almost as if it were normal, so that I stated that hypertrophy had not occurred, but when the strain on the heart became excessive, and the patient was suddenly taken ill, the serious condition of the heart forced itself on the attention. In such cases it is not difficult to verify the extraordinary increase in variation of the pulse, and we can also observe the advanced symptoms of lack of compensation.

Though bound to admit that prognosis is unfavorable we should state that predisposition to a disease does not necessarily mean that a patient will infallibly have that disease, so that it is



possible for a patient with a predisposition to heart disease to go through pregnancy with heart intact and then prognosis becomes favorable. A feature of the cases coming under the second group is that they are either very grave or very mild.

One of my cases in this group ended fatally but in this instance I only noticed angina pectoris during pregnancy and did not examine the pulse in the different postures, and I was not told of the sudden death until after parturition had taken place.

The other case was that of an actress, æt. twenty-nine, whose father, a surgeon in the army, had died of angina pectoris. The daughter had suffered from evident arteriosclerosis since she was twenty. When she was twenty-eight she married and during the first pregnancy the gravest symptoms of angina pectoris appeared; later on lack of compensation and severe heart disease nearly cost her her life, but in spite of this she would not consent to abortion. Examination of the pulse showed a difference of thirty beats in the horizontal and erect positions. It ended in a forceps operation with rupture of the perineum. The child was normal, though later on he developed symptoms of congenital heart disease. The mother is still suffering from attacks of angina pectoris and she has had to give up the stage long ago.

The third group includes, as we have already stated, cases of specific heart disease of pregnancy (*cardiopathie de la grossesse*).

As we gather from the literature of the subject, there is no very definite consensus of opinion as to whether gestational heart disease, as such, exist or not. Experience has merely shown us that previously healthy subjects may suffer during the second half of pregnancy from endocardial disease. In these cases hypertrophy of the organ may be noticed on percussion. Anasarca and edema usually accompany enlargement of the heart. The endocardial bruit is so loud and constant that it is really surprising how these murmurs subside in two, six, or ten days after labor. This circumstance makes it certain that these symptoms which are functional have nothing to do with the symptoms simulating failure of compensation.

The character of the heart affection before labor is much more difficult to substantiate. Observation of the pulse is no help, for it is as variable as in the healthy subject.

As we cannot say with any degree of certainty whether in an individual case we are dealing with a functional disorder or a genuine endocarditis, the prognosis should be guarded. Of course it is quite another matter if we have examined the heart



and pulse beforehand, or perhaps before pregnancy. If we have ascertained that there was no previous heart lesion, and that a latent cardiac disorder could be excluded, then it is probable that we are dealing with a transitory heart disturbance. If, having examined the pulse before pregnancy and found it soft, and the variation in the same keeps on increasing, then we cannot know whether this increasing variability was not preceded by hypertrophy of the heart. Therefore we should be most cautious in giving a prognosis. If, on the other hand, a pulse which was soft at the outset of pregnancy loses this character as the pregnancy proceeds, it is indicative only of gestational cardiac hypertrophy if the heart sounds are clear. But if a murmur is present when the variation in the pulse ceases, we are dealing with a functional disturbance and can only form an unfavorable prognosis when the variation of the pulse recurs again and increases, and also when endocardial murmurs in addition are present. In such cases we either assume that a latent heart affection has manifested itself and given rise to symptoms, or that there are organic heart troubles directly provoked by the pregnancy.

Although we have already stated that in our opinion pregnancy can only cause heart trouble of a temporary nature, we cannot deny that changes in the blood take place during pregnancy both in quality and quantity. From Virchow's writings we know that the white blood corpuscles diminish. Decrease in hemoglobin is not always present. I was only able to observe it in a single case.

**CASE.**—These observations can be very easily made with Gower's hemo-globinometer which is very reliable. My own observations are given in the accompanying table.

The changes which cause the comparative increase in specific gravity of the red blood corpuscles in the diluted blood are accounted for by the blood having to contribute plastic elements to the development of the pregnant generative organs and the growing fetus, and it endeavors to make up this loss by the absorption of serum (*plethora serosa*). The circulation of this blood, which is deficient in plastic elements, throws more work both on the heart and the blood-vessels, the outward sign of which is the elevation in the pulse rate in the second half of pregnancy. From examinations of the pulse made before and during pregnancy I can state that on an average the increase is from six to twenty-two beats per minute. My observations are given in Table IV.

TABLE III.—ESTIMATED QUANTITY OF HEMOGLOBIN IN THE BLOOD OF GRAVID WOMEN.

Age	Number of labors	State of nutrition	Average pulse rate	Quantity of hemoglobin in percentage									Heart
				I	II	III	IV	V	VI	VII	VIII	IX	
28	II	good	84	92	.....	92	.....	90	90	88	80	90	diseased
30	III	anemic	78	89	.....	88	80	80	80	76	70	80	.....
40	II	anemic	80	84	.....	84	82	70	70	76	70	70	.....
20	I	anemic	84	.....	.....	.....	82	.....	82	82	82	80	.....
27	I	anemic	86	84	.....	84	84	70	78	78	76	74	.....
22	I	anemic	89	96	92	90	90	.....	.....	82	86	88	.....
.....	II	anemic	83	88	.....	.....	82	.....	.....	.....	.....	80	.....

TABLE IV. THE STATE OF THE PULSE IN NORMAL PREGNANCY.

Number of labors	Age	Month of Pregnancy										Labour
		I	II	III	IV	V	VI	VII	VIII	XI	X	
I	18	88	82	82	86	88	90	90	90	92	94	Forceps. Male.
I	28	80	80	80	88	88	88	88	88	88	88	Male.
III	26	.....	.....	78	86	86	86	88	88	88	90	Male.
II	26	78	.....	.....	.....	84	.....	.....	.....	.....	90	Female.
II	20	76	76	.....	.....	86	.....	86	86	86	86	Male.
II	20	76	78	78	78	80	84	88	86	86	86	.....
V	30	80	80	90	.....	Ab	orti	n.	.....	.....	.....	.....
II	20	86	86	84	.....	84	84	90	92	90	92	Male.
II	23	80	82	80	.....	86	90	92	95	95	95	Male.
III	23	86	86	86	86	86	96	96	96	96	96	Male.
III	24	90	86	84	84	89	.....	.....	.....	.....	89	Female.
III	24	94	90	90	90	.....	90	90	90	90	.....	Female.
IV	24	82	.....	82	82	.....	82	.....	.....	86	.....	Male.
V	25	86	86	86	86	86	86	86	86	86	.....	Female.
IV	29	78	78	78	80	80	80	.....	.....	82	.....	Female.
IV	38	80	.....	.....	80	.....	80	80	84	.....	.....	Female.
IV	30	82	82	84	86	86	86	86	86	86	.....	Male.
V	31	78	82	82	84	86	88	88	88	92	.....	Male.
V	34	76	76	82	86	88	86	86	86	88	.....	Female.
III	28	80	.....	.....	.....	.....	.....	.....	.....	88	.....	Male.
XII	26	88	.....	.....	88	.....	90	.....	.....	96	.....	.....
IV	32	78	78	78	80	82	84	86	86	86	90	.....

Under the overwhelming strain of work thrown on the heart it is not surprising that parts of it suffer mechanical injury. But there is another scientific fact which confirms the assumption of a heart disorder not especially due to pregnancy.

This fact does not rest solely on a mechanical basis. Since Virchow's researches were published we know that during pregnancy the deposit of fat over the whole body is increased, but he also frequently noticed small fatty patches the size of a lentil on the internal coat of the arteries. These small granules of fat having invaded the intima become detached from it and then get into the bloodstream. If we add to this Dürr's experience obtained from material at the Berlin Charité Hospital, that in 40 per cent. of cases occurring in pregnant women endocarditis is free from bacteria, we have another explanation of the condition.

Endocarditis of choreic, syphilitic and tuberculous origin can certainly be excluded, less certainly endocarditis of gonorrhœic or rheumatic origin. In the latter it is hardly possible to detect the microorganism, which is supposed to be short-lived. It is, however, certain that vegetations have been found postmortem which had not given rise to symptoms during life. We are aware

that endocarditis may be present for months without giving rise to any apparent symptoms. But such valvular insufficiency may become worse and lead both to insufficient closure and to stenosis of the valvular orifice; if it gets very bad the vegetations fall off and an ulcer remains, in exactly the same way as in other endocardial lesions.

Notwithstanding Heiberg's bacteriological investigations from which he concludes that every condition of endocarditis is due to a microorganism, we cannot in view of Dürr's and Virchow's investigations, exclude a mechanical origin, more particularly as the warty growths usually have small fatty granules in the center.

#### SUMMARY.

1. The pulse in pregnant women differs from that of a normal individual in that it loses its normal variability, not only in the second half of pregnancy but sometimes at the outset.

2. The cessation of variability is most probably the sign of normal hypertrophy of heart of a gestational character.

3. The prognosis in cases of pregnancy complicated by heart disease, based on the literature of the subject and my own experience, may be considered as follows:

- (a) In cases in which heart trouble was present before pregnancy, the diagnosis is simple for we meet with marked heart lesions in the early stages of pregnancy. The prognosis in these cases is usually unfavorable.

Variability of the pulse merely disappears for a very short time to reappear again in an increased degree combined with symptoms of dilatation of heart and want of compensation.

- (b) To the second group belong cases in which the heart-affection hitherto latent as a chance factor, is brought in prominence by the pregnancy. Into this category fall also cases of angiosclerosis or those with hereditary tendency and also those cases aggravated before labor by some serious disorder of an infectious nature, like influenza, typhus, gonorrhea, or by some general ailment, such as tuberculosis, syphilis, rheumatism. Diagnosis will present no difficulty if we carefully investigate the causes referred to, and we shall find that the heart trouble develops gradually and attains proportions consistent with the degree of the general disease and the occasional factor present. Prognosis may, therefore, be quite favorable in some instances in this group.



ADDITIONAL CASES OF NEPHROURETERECTOMY.  
REMOVAL OF LARGE SUPPURATING KIDNEYS.

BY  
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THESE two cases represent the fifth and sixth in which I have removed the kidney and ureter in one piece. In quite a number of others the ureters have been removed in part or in pieces.

There are several points of interest in the history of the fifth case. She was a very delicate woman upon whom I operated five and a half years ago for ruptured papillomatous cyst of the left ovary. The papillomatous mass was larger than a grape fruit, and secondary growth was scattered over the anterior abdominal wall and intestines. After removal of the mass secondary growths were thoroughly scraped away and cauterized with a thermo electric cautery. She made a good recovery but returned seventeen months afterward for removal of a post-peritoneal cyst behind the cecum. It was made up of enormously dilated lymph spaces and measured 6 by 8 inches in dimension. She came back two years and a half later and stated that for the last twelve months she had had chills, irregular temperature, pain, tenderness and swelling in the left lumbar region. At the time of the examination the swelling extended forward and inward from the left hypochondriac and lumbar regions to the median line and downward to the level of the anterior superior spine of the ileum. The temperature curve was characteristic of septic infection, urine loaded with pus, and patient's general condition extremely bad. In digital examination a stone was felt up under the bladder, occupying position of the lower end of the left ureter. It was clearly a case of pus kidney (from ureteral calculus) engrafted upon hydronephrosis. On account of the extensive dilatation of the kidney and the patient's physical condition, and believing she could not stand drainage of prolonged suppuration incident to removal of stone, nephrectomy was decided upon. The loin incision, 5 inches in length, extended obliquely downward and forward. The kidney was evacuated, and after some difficulty was delivered

through the wound and cut free from its vessels. The ureter was then cleaned by digital dissection and cut off close to the bladder with a long pair of scissors passed through the loin incision. The ureteral stump was not ligated.

Case VI gave a history of hydronephrosis from childhood, repeated swelling, pain and tenderness in left side and later copious discharge of pus in urine. Urine was rarely free from it. After growing up to adult life trouble became worse and the distention more frequent with chills and irregular temperature. For the past twelve months the left lumbar and hypochondriac regions have been distended by a mass extending nearly to the median line in front and as low as the anterior superior spine of the ileum. Occasionally the rounded outline would disappear, but on deep palpation a semifluctuating mass could occasionally be felt. A ureteral catheter entered the ureter for about an inch and there met with obstruction. On account of the chronicity of the case and enormous dilatation of the kidney, nephrectomy was done. Considerable difficulty was experienced in dissecting the kidney free on account of perinephritis, and for the same reason a second incision in the left iliac region was necessary to separate the ureter from the iliac vessels. Close to the bladder a fibrous band was encountered passing over the ureter and drawing it sharply downward causing a "Z"-shaped kink. The ureter was dilated to this point but here suddenly reduced to its normal size. The band was broken and a slight portion of the normal ureter separated and pulled out of the bladder walls and cut off with scissors.

Both patients made good recoveries.

For convenience of description, I would divide the subject of pyonephrosis into two classes. First, cases due to primary infection of the pelvis of the kidney. Second, pyonephrosis engrafted upon hydronephrosis.

Not infrequently kidneys of the class first mentioned are unnecessarily sacrificed for the lack of careful investigation. I refer particularly to examination of urine for solids in preference to testing permeability with drugs.

When the disease follows hydronephrosis it is not so important from the fact that tissue atrophy occurs and destroys the usefulness of the kidney, especially in chronic cases. Besides this, the history, the large size of the pus sac, and other symptoms elicited by palpation would prevent one from confusing this condition with suppuration originating in primary infection

except in rare instances. Exceptions are encountered in cases of spontaneous removal of the obstruction to the outflow of urine, when large flaccid kidney sacs may collapse so completely that they not only lose their outline, but it may not be possible to detect them by careful palpation even in thin relaxed subjects.

Then it will become expedient to resort to the well-known method of measuring the capacity of the kidney by ureteral cathetrization for examination for solid constituents of the urine. Enormous capacity and the absence of urinary solids indicate renal atrophy.

In pyonephrosis of primary pelvic infection, the mass or sac does not grow so large but preserve more or less of the renal contour, palpation, therefore, may lead us to suspect the nature of the case at once. However, smaller capacity of the kidney and the presence of a fair percentage of urinary solids warrants an attempt to save the kidney. In chronic cases the walls of the pelvis may be so thickened from previous attacks that it does not dilate materially but the mass increases at the expense of the calices. This gives the kidney a lobulated appearance, indicating atrophy of renal tissue and prompts further investigation. When it is impractical to collect urine from the kidneys separately, preoperative investigation is unsatisfactory. This may occur with kinked or impacted ureters. Dependence then must be placed upon the gross appearance of the kidney. It should be opened extensively (if necessary from pole to pole), and the pyramids inspected. If atrophy has not occurred the kidney may be saved provided the obstruction can be relieved. Upon the other hand if the pyramids have atrophied or if the pelvis is filled with cheesy or inspissated pus and tissue débris masses it is an evidence of complete blocking, chronicity and tissue atrophy.

In doubtful cases temporary drainage through the loin incision may be resorted to and urine collected for analysis. If the urinary solids are not present or do not progressively increase as the discharge of pus subsides, tissue atrophy has occurred and the uselessness of the kidney proven. A free flow of watery urine with the absence of solids indicates functional activity of the cortex and destruction of the pyramids. In such circumstances the cortical portion of the kidney is not only of no service but is positively harmful as a contributing factor to the suppurative process. Upon the other hand if the functional activity of the pyramidal portion of the kidney has not been lost and if there is

shown a tendency to increase the output of urinary solids, the kidney may be saved provided the pelvis is neither excessively dilated nor anchored mesal to the peritoneum and deeper tissues by perinephritis. The tendency in such circumstances is to the formation of pockets and accumulation of residual urine that may undergo decomposition and become a fertile culture media.

In connection with the above brief outline the general health of the patient and other circumstance must be considered. If the patient cannot withstand prolonged suppuration and discomfort or drainage, a kidney that otherwise might be saved, must be sacrificed. Again perinephritis involving the pedicle, making it rigid and interfering with proper anchorage of the kidney to the loin incision, increases liability to urinary extravasation in the extraperitoneal fatty tissue and becomes a complication that may warrant the sacrifice of a kidney that might in other circumstances be saved.

If the colon be involved and its walls softened by intense infection, it is better to extirpate the kidney as urinary extravasation is liable to result in fecal fistula and death.

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## THE NATURE AND TREATMENT OF VASOMOTOR AND TROPHONEUROSES.

BY

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The so-called vasomotor and trophoneuroses play an important part in the practice of medicine and from the frequency of their occurrence in the female should be particularly important to those interested in the specialties of diseases of women and children. A painstaking research of the literature has shown that a concise modern resumé of the vasomotor and trophoneuroses exists nowhere in the English, and therefore a paper upon the nature and treatment of such disorders should be welcomed.

The acroneuroses form a small part of the so-called functional neuroses, yet an intimate acquaintance of their essential nature is important for understanding the mechanism of vascular spasm



and paresis. The various vaso-motor disorders exist both as symptoms in other organic disease and as distinct functional disease entities. The importance of more extended research upon the anatomy and physiology of the vasomotor nerves and their disorders is obvious. The difficulty of such study is likewise apparent and accounts in no small part for the indefinite data regarding the pathogeny of the acroneuroses.

In view of the foregoing, the author has prepared for the JOURNAL'S readers a resumé of the entire subject, excluding all data not authentic or fully proven. It is hoped that the paper will stimulate to renewed inquiry in this special field.

ANATOMY AND PHYSIOLOGY OF THE VASOMOTOR NERVES.  
(*Angiospasm and Angioparesis.*)

In the conviction that a vasomotor center must exist somewhere in the central nervous system, the earliest efforts of experimenters were in this direction. The first clue was given to a center or path in the floor of the fourth ventricle which stood in relation at least to the vasomotor apparatus of the liver and kidneys (Bernard). Ludwig isolated a center in this locality, stimulation of which caused narrowing of all the arterioles in the body; while destruction of the same caused paresis of these vessels. It was next learned that the vasomotor paths did *not* lie either in the anterior, posterior or posterolateral columns of the cord. They, therefore, must be found if at all only in the anterior portion of the lateral columns, and are more likely to be found in the gray matter rather than in the white. In the course of time it was accepted that the vasomotor apparatus in the cord consisted of ganglionic cells in the anterior horns of gray matter (its median-dorsal zone) which are small and connected with one another by thin fibers, some of these passing out of the cord in the anterior spinal roots, later anastomosing with the independent sympathetic system. Anatomical demonstrations of this continuity have been all but impossible, but it has been shown repeatedly by anatomophysiological experiment. Division of the sympathetic trunks at any level may be followed by degeneration of certain of the ganglion cells of the cord, not only those mentioned above, but others here and there throughout the gray matter elsewhere in the cord. To sum up our knowledge of the vasomotor nerves of the extremities, the head is supplied chiefly from the cervical sympathetic, although a few

fibers proceed directly from the vasomotor center in the medulla through the cranial nerves which originate in that locality. The upper extremities receive their vasomotor fibers through the anterior roots of fourth to the tenth dorsal nerves, from which they pass through the rami communicantes to the transition cord, thence to the stellate ganglion and brachial plexus. Similarly the lower extremity is supplied through the anterior roots of the last dorsal and first three lumbar nerves, the fibers passing thence to the sympathetic ganglion (sixth and seventh lumbar and first and second sacral).

It was long believed that the vasomotor nerves passed only to the arteries, but later it was recognized that the veins also possessed contracting nerve fibers (venomotors), the course and distribution of which agreed throughout with that of the arteriomotors.

The exact peripheral distribution of the sympathetic supply of the arteries and veins is given with sufficient thoroughness and precision in the standard works on general anatomy, gross and microscopic. Neurology does not concern itself much with this phase of the subject-matter.

Let us now consider the physiological relations of the vasomotor center of the medulla. There is consensus in the belief that this center exerts a toning function, an uninterrupted impulse which maintains a status of medium vascular contraction. This function is known to be modifiable through the blood composition, air hunger causing excess-contraction. The same phenomenon occurs simply from shutting off the arterial blood supply, from certain acute poisonings (*nux vomica*, tobacco) and from electric stimulation of the center. The latter may be reflexly excited or depressed, and it is believed that excitory and depressing fibers exist independently of each other in all sensory nerves. Stimulation of excitory fibers causes rise of blood pressure, and the kind of peripheral stimulation varies within wide limits. Electrical stimulation of the skin, cold or heat to the surface, tickling, unpleasant odors, tastes, and irritation of the optic and acoustic nerves may all cause reflex angiospasm with reduction in size and lowering of surface temperature in the extremities. The same reflex can be obtained in the mucosæ. The opposite reflex due to vasodilatation results from certain painful sensations, also from agreeable odors and tastes.

It does not appear that vasodilatation in such cases is preceded as a rule by vasoconstriction or that primary angiospasm

is followed by vasodilatation, although such sequences are sometimes in evidence. Reflexes like those just narrated have been studied in detail in hysterical subjects and others in whom reflex excitability is increased. Sleeping subjects have been tested. Vasoconstriction may be elicited far more frequently than vasodilatation. The reflex is universal in its radiation, but the irritated part is the first to show it. When vasodilatation is obtained the subject is often in a state of general fatigue.

The highest type of depressing or vasodilator action is seen after section of the sympathetic, where, as best typified in the ear, redness, heat and swelling result. But when stimulation is sufficiently pushed, vasodilatation also sets in as a pathological phase with similar manifestations. In peripheral palsies the vasomotor symptoms naturally resemble those seen after section and exhaustion, but there are some paradoxal factors concerned here because section of peripheral nerves is not necessarily followed by rise of temperature in the extremities, and Weir Mitchell never saw this sequence develop. Evidently section of an entire mixed nerve produces some compensatory changes which are not in evidence after simple division of the sympathetic. If the entire spinal cord is divided, the temperature rise in the extremities is sudden and marked.

Stimulation in any way of the vasomotor center naturally increases the work of the heart, and *vice versa*, and a sort of vicious circle is set up, so that the most peripheral localities like the nose, ears and digits have their circulation greatly modified as compared with localities more centrally seated. An anatomical element is a factor here, to wit, the very different degree of development of the muscular coat of the arteries in different localities. This is why certain structures are hardly if at all affected by vasomotor disturbances—the bones and the great vascular trunks for example—for their blood-vessels have a poorly developed muscularis.

The groups of ganglion cells throughout the cord which make up such an integral part of the vasomotor tracts all constitute so many secondary vasomotor centers; and when these are divided, or stimulated directly or reflexly at different levels, phenomena result in the peripheral circulation which are of the same character as those already narrated.

Even after the entire central nervous system has been extirpated, some vascular tonus is seen to remain. Local peripheral centers must therefore exist, and such are seated in the coats of



peripheral blood-vessels. These have not only been seen in the adventitia and muscularis, as plexuses and isolated cells, but they can be stimulated by adrenalin injected into the general circulation in animals deprived of all central nervous apparatus. These structures can also be made to respond to reflex irritation like the central centers, and several mechanical and thermal local reflexes can be explained in no other way. Here belong dermographism and Gubler's vein phenomenon (percussion of a dorsal vein of the hand causes diminished caliber up to affacement in specially irritable individuals).

We next come to the question of the existence or nonexistence of special central or peripheral centers for vasocontraction or vasodilatation. While there is evidence that such structures exist they have not yet been isolated. They are assumed to exist in the medulla and cord, whence it naturally must follow that special dilator and constrictor fibers exist. Many phenomena can only be explained on these suppositions. The existence of a special dilator center is bound up with the phenomenon of "heat puncture." It has long been known that irritation of various portions of the encephalon causes rise in temperature which is incidental to vasodilatation. Thus cautery of certain areas of the cortex in the dog causes rise of temperature in the opposite half of the body, which sets in immediately and varies from  $1^{\circ}$  to  $13^{\circ}$  C. This cortical thermogenic area corresponds to a large extent with the motor area of the fore- and hindquarter. The rise may persist for days. A corresponding center for the head has not been found. It should be said that the existence of this thermogenic area in the cortex has been disputed. Some would locate such a center in the subcortex, especially in the corpus striatum, and the most recent studies place it in the free border of the caudate nucleus. Phenomena in man analogous to those obtained by experiment in the dog are not known to exist, which robs this matter of much of its interest.

The exact area of the vasomotor center in the medulla has been the subject of much debate, and clinical and pathological studies in the human subject have contributed many data which are in fair accord with the results of animal experiment.

It may suffice to give the following conclusions in this connection without pausing to relate the steps by which they are attained: Animal experiment shows that the seat of the center in the medulla corresponds to a large portion of the fourth



ventricle, while pathological studies in man serve to make this probable for the human species, but a rigorous demonstration cannot be made. Much study has also been devoted to the site of the paths between the center in the medulla and the ganglion cells in the cord, and also as to the existence of paths above the center leading to vasomotor areas in the gray matter of cortex and subcortex. It seems safe to assume that the system as a whole has many different levels. It is probable but not proven that a superior high level exists in the cortex through the internal capsule to the great subcortical ganglia, where the next highest level occurs either in the thalamus or caudate nucleus. The conducting paths then lead through the pons to the great center in the medulla. Other fibers pass into the lateral aspects of the cord where the central gray matter constitutes a continuous series of spinal centers. The rest of the system has already been considered, the lowest level of centers being in the coats of the peripheral vessels themselves.

Two other conclusions must here be inserted. 1. Special dilating and constricting centers may be shown to exist physiologically, if not anatomically, and 2. while the vasomotor functions comprise both constriction and dilatation, the former act is far more in evidence, and under reflex stimulation we are far more apt to see constriction than dilatation—angiospasm rather than angioparesis.

The physiology of glandular activity and those of trophic disturbance may be left out of consideration, the first because they play but an insignificant known rôle in vasomotor neuroses, and the latter because the province of this work does not include them.

*Acroparasthesia* is essentially a sensory neurosis of the peripheral nerves, especially of the extremities, characterized by objective sensation of burning, pricking, pins-and-needles, numbness, crawling, itching or breaking sensations.

The disorder was first recognized by Nothnagel in 1867. Its clinical manifestations as a neurosis were, however, first outlined by Putnam of Boston in 1880, in a report of thirty-one cases. He called special attention to that type of the disorder characterized by numbness in the extremities, recurring periodically at night or in the very early morning. Dana next analyzed its objective manifestations in 1885 in a report of twenty-eight cases. Saundby also reported upon the subject in the same year. Lacquer further contributed to our knowledge of acroparasthesia

in a paper published at Frankfort in 1893. It remained for Schultze of Bonn, however, in 1893, to coin the word by which the affection is commonly known.

The disease is of much more frequent occurrence than is ordinarily supposed. It forms about 3 per cent. of all cases frequenting nervous clinics. It is therefore seen about one-tenth as frequently as neurasthenia. Several hundred cases have been placed on record and carefully analyzed.

*Etiology.*—The great majority of patients are females. Frankl-Hochwart found only twelve males in 162 cases. The greatest age incidence is from thirty to sixty (106 in 129). Extremes of age are twelve years and seventy and upward.

*Occupation.*—The laboring classes furnish most of the cases, such as laundresses and others who work with hands in water. Cabmen who wash their vehicles in all kinds of weather frequently suffer, showing the joint action of wet and cold. Overuse of the hands in sewing, milking, etc., will produce the condition. The menopause is apparently a predisposing factor, and a further dependence on the sexual life in women is seen in cases which occur in pregnancy, the puerperium and in one case after extirpation of a uterine myoma and ovariectomy (Cassirer, Sinkler).

Attempts to implicate the circulation such as in the anemias and arterioscleroses, rheumatism, etc., are less successful. These factors can act only in the most general way, by impairing the general bodily vigor. Few cases are referable to alcohol and other intoxicants and traumatism. No hereditary influence, syphilis, race, or neuropathic constitution can be traced in its etiology. The disorder stands in some causal relation to malnutrition, especially to derangement of the gastrointestinal functions. In a half of the cases indicanuria exists. A third of the cases suffer from constipation. A fifth of the cases are grossly obese and of sallow complexion, and suffer from some form of dyspepsia (Lesem). It would therefore seem that auto-intoxication plays the greatest single rôle in its causation aside from occupational exposures. An excessive alkalinity of blood was found in a third of Collins' cases (2.4 per cent.; 2 per cent. is normal).

*Symptomatology.*—The patients complain most frequently of unpleasant sensations in the hands and less commonly in the feet. These parasthesias comprise formication, itching, numbness, hyperesthesia and others more complicated and systematized.

They are usually intermittent, not continuous, most marked at night and in the early morning hours. Some motor inefficiency may be present also on awakening, as shown by awkwardness in dressing. This, however, soon wears off and its disappearance is also hastened by friction. Parasthesias are in some cases limited to these waking moments. Both hands are usually involved, one more than the other, but the disturbance may be limited to a part of one hand, or even one finger. The feet sometimes participate in this symptom-complex and very rarely the tongue and lips. The parasthesia does not conform to any particular nerve distribution although the ulnar side of the hand is most commonly affected.\*

The objective findings are very meager. Tactile sensibility is little altered. Only in exceptional cases can objective disorders of sensations or motility be demonstrated. There is no tenderness along the nerve trunks nor are the parts painful to pressure. Pallor is sometimes evident and these patients complain especially of algid sensations. The so-called vasomotor complex of pallor, objective coldness and cyanosis with subsequent heat and blushing is seen in a small percentage of cases. This type may perhaps be best regarded as an abortive form of Raynaud's disease, the Nothnagel type to distinguish it from the ordinary Schultze type. But local asphyxia does not as a general rule cause acroparasthesia.

*Diagnosis.*—This is not usually difficult, but many conditions of the nervous system are accompanied by paresthesiæ. Thus in mild sensory neuritis where disturbances of motility and nutrition are absent we may have paresthesia in the distribution of the nerve. In this condition there is usually increased sensitiveness to pressure, and absence of the tendon phenomenon. Buzzard has reported cases of peripheral neuritis in which the subjective symptoms were those of acroparesthesia, including the vasomotor disturbances. In his cases the paresthesia was also worse in the morning. If paralysis and lowering of electric excitability are present, neuritis is of course in evidence, and hence Buzzard's

\* Attempts, however, are not wanting to show that acroparasthesia is a posterior spinal root disease (Sinkler, Dejerine and Egger, and Pick). The authors assume that an irritation of the posterior roots in the intramedullary portion causes a vasoconstriction of the arterioles of the fingers, whereupon the disturbance of subjective sensibility results. The objective disturbance represents a simple sensory irritation without vasomotor implication. We are quite ignorant of the nature of the central irritation. It hardly seems likely that this disorder can be made to parallel *posterior poliomyelitis* as here attempted. The great majority of cases of acroparasthesia cannot be made to assume the radicular type as shown in Egger's text figures.



cases have unanimously been looked upon as neuritis rather than acroparesthesia.

In Schmidt's twenty-one cases of acroparesthesia there were neuralgiform pains and bilateral tenderness over the brachial plexus. This type of cases according to Schmidt is more common in men. Of the greatest significance, however, is the fact that these patients were tuberculous and had lesions of the apices, and there was apparently a definite relationship between both the incidence and the severity of the two affections.

Acroparesthesia may therefore accompany certain cases of peripheral neuritis and neuralgia. There is a similar association with certain professional neuroses, but acroparesthesia essentialis cannot be regarded as in any sense a neurosis of excessive action; on the contrary it often improves under similar occupations.

It is very difficult to distinguish at times between essential acroparesthesia and hysteria, for paresthesia is a hysterical stigma. We have to exclude hysteria through the absence of other hysterical phenomena, natural and induced. Whatever may be said of hysteria in this connection also holds good for neurasthenia.

Berger has seen paresthesiæ which markedly resemble and yet differ decidedly from acroparesthesia. They occur chiefly in the young and are described chiefly in the lower extremities. The paresthesiæ come on after prolonged standing, and extend from center to periphery. They may be unilateral or bilateral. They comprise formication, tingling, burning, etc. They occur in paroxysms of perhaps a few minutes' duration and are accompanied by a feeling of great weakness. The attacks may succeed each other rapidly and terminate in a state of hypochondria. Vasomotor phenomena are absent. This condition is a very distressing one and does not yield to any known treatment. Cassirer has seen one case only.

Tetany may be accompanied by paresthesiæ but there should be no trouble in excluding it. The same may be said of acromegaly. In the latter condition we may see not only acroparesthesia but acroasphyxia. The vasomotor type of acroparesthesia may be encountered in erythromelalgia and Raynaud's disease.

Of organic affections of the central nervous system tabes dorsalis and spinal syphilis are known to be accompanied with acroparesthesia. There seems no doubt that unilateral acroparesthesia may be of intracranial origin. It may precede or accompany apoplexy and in certain cases may in itself represent



a mininial apoplexy in connection with arteriosclerosis of the cerebral vessels.

Toxic acroparesthesia has been seen in ergotism, alcoholism, diabetes and Bright's.

*Prognosis*.—This is not good as far as chance of recovery goes. The condition may persist for years without growing worse or developing complications.

*Treatment*.—When the cause is sufficiently obvious the occupation must be changed, but owing to the poverty of the victims this is not readily accomplished.

Faradism is apparently the most successful remedy. The brush or hand bath may be used. It is not always efficacious. Other measures which have been recommended are galvanism of the cervical spine, and Franklinisation. Hydriatic measures of various kinds have seemed to be beneficial—alternation of hot and cold douches, general bathing, use of salt-water frictions. Alcohol frictions are also recommended.

Drugs are used on indication only, as those applicable to underlying states such as anemia, digestive disturbances, nervousness, etc. Thus Saundby claimed brilliant results from rhubarb and calomel, his cases evidently depending on conditions of the stomach and bowels.

*Akinesia Algera*.—Möbius first described this condition in 1891 as one in which motion was so painful that the patient was practically motionless. General neurasthenia coexists. The condition seems to set in after overexertion. Patients are to be conceived as "hypos. with pain illusions," the pain being hysterical in type. There are analogies between this affection and total anesthesia. The condition partakes of the nature of the severest neurasthenia, hysteria, and hypochondria and Möbius regards the victims as essentially paranoiacs. Recent observers have seen the condition with recurrent mania. The amount and character of the suffering being about persecutory delusions, hallucinations and suicidal impulses. Concerted action is impossible. The eyes suffer from photophobia, attempts to think produce headache. As pains of such nature and amount could not be accounted for objectively, some writers believe the condition to be one of insanity from the very outset.

Oppenheim sought to show that this condition is but a symptom which may accompany any psychoneurosis or psychosis. A mild case produces the impression of a traumatic neurosis.

Bechterew saw the condition in 1879, or many years before

Möbius first described it. He has seen in all three cases and regards the condition as a psychosis.

Stompfe in 1898 reported cases in a brother and sister.

The source of the pain is the vital point. It is really psychogenic. Bechterew saw evidence of actual pain (disturbances in pupils, pulse and respiration). In some cases objective sources of pain can be demonstrated. Bechterew also found painful zones in hypnotized patients.

M. Schaikewicz relates a case in which he thinks pain might possibly be referred to flat-foot. In another case profound hypochondria was the only objective condition. Of all the material thus far reported, the author's flat-foot case was the only one without the psychoneurotic substratum. He was no paranoiac and presented no evidences of hysteria or hypochondria. The pains were not referred to the feet, and congenital flat-foot is said to be essentially painless.

The patient was a soldier twenty-seven years old. He could not walk or even move his legs in bed for the pain. The condition had lasted six years, having begun without apparent cause. Passive motion caused pain equally with active motion. Pressure and percussion were painful. Psychically patient was depressed and apathetic. Sensorium normal in all respects. Special senses all normal. Patient could not be hypnotized. Suggestion was tried under chloroform but to no purpose.

#### ACUTE CIRCUMSCRIBED EDEMA.

Acute circumscribed edema is an affection characterized by the occurrence of local edematous swellings, more or less limited in extent, and of transient duration. It has been called Quincke's disease.

*Etiology.*—Sex appears to exert no influence. The affection occurs at almost any age, and the decade of greatest incidence is the third with the fourth next in order, and the first decade of life third. The disease has been seen in very young nurslings, and no doubt very full statistics would show a steady incidence up to the age of forty, after which there is a steady and rapid decline, so that very few cases have been noted in the aged.

Occupation exerts but little influence. In some cases there has been exposure to cold air or water.

The disease belongs in part to the familial maladies, and has occurred in several successive generations. In these familial

cases the inheritance appears to follow certain unknown laws. "Equivalents" in family cases comprise migraine, epilepsy, chorea and general neuropathy. Heredity may fail entirely.

Of states which predispose to the disease, a few seem to play a more direct rôle than the usual ill health, anemia, etc. A rheumatic factor seems in evidence sometimes, although when the two conditions coexist they appear to pursue their course independently of each other. Intoxication in the widest sense of the term plays a part in many individual cases. Among oxogenous poisons alcohol should first be mentioned, but not many cases are on record. Food poisoning of the sort which produces acute urticaria may be a more common cause, but it is not easy to state whether the poison enters the body from without or results from an autointoxication. The lesions of urticaria, as will be seen later, shade into those of acute circumscribed edema. Some authors believe that the supposed cases of ptomaine origin are really urticaria, and regard pure Quincke's disease of this origin as rare. A definite connection with malaria has been noted several times.

The association with various forms of organic nerve disease—central and peripheral—is hardly common enough to indicate more than coincidence or at best a neuropathic substratum. Of the frequency of the latter as a predisponent there can be no doubt. In very many cases the patients are frank hysterics or neurasthenics. The affection probably shades into the transient edemas seen in hysteria. Association in individual cases with migraine, neuralgias, Basedow's disease and various psychoses probably is more frequent than chance would explain.

*Exciting Causes.*—In the predisposed, slight wounds of the extremities are sufficient to cause edema. Herein, as in other respects (familial incidence), the affection resembles epidermolysis bullosa hereditaria. Several times the two affections have occurred side by side in the same subject. Psychic trauma has also been accused, as have emotional crises, intense overwork (physical and mental). Influence of cold on the exposed parts of the body play a definite rôle, as in other acro-diseases. Particular kinds of exposure have determined particular localizations (as in Starr's case of edema of nates from exposure in a privy seat. That refrigeration of the surface is an actual efficient cause seems shown by the occasional coincidence of hemoglobinuria.

Menstruation and pregnancy as well as the climacteric play a



part in some cases which may be regarded as predisposing or exciting, according to circumstances. In one case, however, the disease ceased after impregnation to return after confinement. The influence of the genitals is looked upon as reflex in character. Other reflexes have been recorded, as in the case where chronic acid cauterization of the membrana tympani caused edema of the tongue, ankles, etc.

*Symptomatology.*—The edemas which characterize the disease may be divided into subcutaneous, submucous and articular\* (including tendon sheaths). There is also a group of renal symptoms, and perhaps a category of central and general symptoms.

In typical cases we see notable transitions to urticaria, on the one hand, these transition cases being common; and also transitions between edema and other acro diseases.

The course of the malady is acute. Prodromes may or may not be present, and when such occur they do not differ from general symptoms noted during the actual presence of the disease. They comprise discomfort, lassitude, chilliness, anorexia, etc.

The edema is sharply circumscribed, of very varying extent, elastic (no pitting, or at best very slight and transitory), and with little discoloration (there may be a slight abnormal tint of yellowish or pinkish, or a pale or waxy hue). The swellings supervene rapidly—from minutes to hours—remain in status for several days (limits one to three or four), and disappear with relative rapidity. There are practically no sensory phenomena beyond a feeling of tension and at times slight itching.

To return to the dimensions of the swellings, these may vary from pea size to palm of hand, but exceptionally a whole member may swell, as the leg or forearm, and in certain localities, as the scrotum, the whole area will be involved. In some cases large lesions result from the coalescence of smaller ones. When this occurs, marked redness is said to accompany. The prominence

\* *Quincke's Disease of the Periosteum.*—Heinrich Stern (*Med. Record*, Oct. 24 1908) describes angioneurotic edema of the periosteum of the ribs, sternum, etc. Herz and later Lublinski have described such a condition, which naturally simulates periostitis. The lesions come and go quickly, less so naturally than in the skin, and recur at intervals. In a few cases it has been seen in members of families. There is usually but a single lesion (Stern has seen one case with multiple lesions). Size from pigeon's egg to half a good sized apple. The swelling is more apt to occur on the intrathoracic aspect, where it causes symptoms of pulmonary or cardiac irritation. Sam'l West has described a somewhat similar condition in rachitic children. The author chiefly knows the affection as occurring in women of mature age (thirty to forty), and bearing some relation to the menses. The adult patients often show signs of early rickets. It may be associated with ordinary angioneurotic edema of the surface, or may occur by itself. The author makes no definite mention of vasomotor crisis in other organs.



of individual lesions varies greatly. Usually not marked it may be excessive and to be computed in inches. Exceptionally the sharp line of demarcation with normal skin may not be in evidence.

The general shape of the lesions is roundish. Exceptionally they are more or less elongated and may even present a sausage shape.

Although spoken of as subcutaneous, they may be seated directly in the skin, and the smaller the lesion the more nearly is it confined to the latter; although according to some reporters very small nodules may refuse to move with the skin. The exact seat of the swelling no doubt constitutes a factor in the color and consistency of the lesions. Thus those in the skin itself should be more tense, more discolored, itching, etc., in comparison to those in the subcutaneous tissue. But exact statements as to these do not exist (Cassirer).

The limits of circumscription may go to such extent that foci of subcutaneous edema have imposed themselves as fatty tumors. Consistency may vary extremely from a brawny feel like a tense biceps to relatively soft, petting for a few seconds. The color limits as already stated may approach deep red, or may include absolute ischemia, and these extremes may alternate. Sometimes warm, some swellings may be cold to touch and thermometer. Redness usually means warm, pallor cold. It is probable that as a rule the surface temperature is lowered, perhaps after an initial rise. Temperature studies are much needed. In cases which are provoked by exposing the hands to cold, comparative studies in swelling, discoloration and temperature have been made. In one such case the temperature rose in proportion with the swelling, going from 70° F. after exposure to cold water to 93° F. But the color in this case was pale and wax-like during the rise of temperature. The hand and fingers swelled throughout, the fingers becoming stiff.

The most striking feature of the disease is the rapid and disfiguring swelling which is specially in evidence when the eyelid or upper lip is the seat.

In cases where the lesions have a special tendency to redness, heat and itching we should suspect the urticarial factor, but the two affections may exist side by side. A further differential point is the more volatile character of urticarial lesions.

The severe pains present in other acro-diseases already described are seldom or never present here, and this may also be

said of essential paresthesiæ, for the various uncomfortable feelings are due to tension and pressure.

When the lesions subside no residual changes are observed, not even after repeated attacks in many cases. In special localities, however, as the eyelids, some permanent swelling may result in time.

Urticarial lesions are often complicated by purpuric extravasations, vesicle-building, etc., and one would expect the possible development of such complications in acute circumscribed edema. This seems to have occurred in a very few instances.

*Localization.*—The lesions have been noted in every locality of the body—perhaps least of all in frequency is the scalp. The predisposed localities are those of local edema in general, lips, eyelids, cheeks. Here the lax cellular tissue is to be considered. Naturally the localization in the genitals—not a common one—must be due largely to this factor. With this anatomical factor left out the localization is that of an acronosis, affecting the upper more than the lower extremities. The predominance of face and hands over feet in this regard illustrates the influence of exposure to air, and to external insults of all kinds. Symmetry is much less in evidence than in other acronoses. French neurologists have apparently noted a connection between locality and the spinal segments. The affection may be unilateral. A special localization for this affection is the region of joints. In some cases these periarticular swellings simulate other conditions closely; thus swelling over the temporomaxillary joints may resemble mumps, etc.

The submucous localizations—save when certain structures like the tongue are involved—are unlike anything seen in other acroneuroses. The upper air and food passages are very frequently involved. Of individual structures participating may be mentioned the tongue, gums, tonsils, cheeks, palate and uvula, pharynx, nasal mucosa and most important of all the glotts.

Naturally many other diseases in these localities may be counterfeited. The relations of acute circumscribed edema of the glottis to acute edema of the glottis as an old clinical entity are naturally of the greatest speculative and practical significance. The prognosis and treatment in a condition almost certain to subside quickly in itself, despite the alarming quality of the symptoms, would naturally differ much from the same bearings in another sort of edema. Some authorities are inclined to locate acute circumscribed edema, when it is so seated as to

threaten suffocation, in the structures above the glottis. Not many typical cases come to the laryngologist and hence this point of localization has never been settled. Swelling almost anywhere in the faucial region would, if extensive enough, shut off the air from the larynx; and in certain such cases the edema seems to have been confined to the tongue. There seems no doubt that a few subjects have suffocated from such swellings while others have been saved by tracheotomy. It is believed that edema in these localities is of unusually brief duration, perhaps not over half an hour, and in no known case over one night's length. The same obscurity as to localization which obtains for the glottis holds good for the tissues lower down. Some have seen in certain asthmatic paroxysms a possible bronchial localization; others in paradoxal cases of edema of the lungs a similar localization still deeper in the chest.

The eye localizations show considerable variety. Aside from the implication of the lids we may have marked swelling of the conjunctiva bulbi with echemosis. Another possible phase is exophthalmus from retrobulbar swelling. Certain affections of the eye and nose alone of conjoined—lachrymation, sneezing, swelling of eyelids, stopped nose, profuse rhinorrhea—closely simulates hay fever. Only the coincident presence of swelling of the hands, etc., has suggested the possible nature of the case.

The various gastrointestinal derangements which accompany urticaria and have been styled "*urticaria interna*" may sometimes be seen in Quincke's disease and comprise gastric and intestinal crises of pain and vomiting or diarrhea or constipation of nervous stamp.

Typical of the disease when they occur are the fugitive swellings of tendon sheaths, perhaps entirely unaccompanied with superficial swellings. They seem to bear a definite relationship in some cases to menstruation and conception, being aggravated during the former and subsiding after the latter. They are seated in the tendon sheaths of the hands and may be accompanied by painful contractures of the fingers. Similar swellings seem to have been noted in regions where tendon sheaths and bursæ do not occur—as in muscular aponeuroses (occipito-frontalis and temporal). The localization in joint cavities is distinct from the preceding and is in fact a manifestation *sui generis*. Known to surgeons as intermittent joint dropsy. It must be distinguished from the periarticular swellings already named, and is almost peculiar to the knees, one or both. It is



placed under Quinke's disease because of its occasional association with subcutaneous edema and with neuroses and other manifestations of presumably vasomotor origin. It is said to be at times a familial affection.

The renal symptoms of the disease include paroxysmal hemoglobinuria, polyuria, albuminuria, and in short conditions which might be brought about by a vasomotor crisis in the kidneys. In some cases the renal symptoms might, however, be explained by paroxysmal tachycardia, hysteria, etc.

Of central symptoms are those which might be due to vasomotor influence—headache, drowsiness, vertigo, a meningeal syndrome, etc.—due at times, perhaps, to lesions in other organs. Thus cerebral symptoms might follow the gastrointestinal crisis.

To regard the affection as a clinical whole, the majority of cases exhibit external localization only (skin and subcutaneous tissue) associated in some degree with gastroenteric symptoms which may serve as a prodromal stage. One attack of swellings may last, as already stated, from one to several days, and in the majority of cases the lesions are single rather than multiple for a time, so that when multiple one usually follows another elsewhere with some overlapping. The most opposite localities may be involved in the succession of lesions.

A very common experience is a complete attack of several weeks' duration, made up of the successive evolution of individual lesions in a number of localities. Intervals free from attacks occur in extreme variations. Some individuals have gone many years without a second attack. At the other extreme a diurnal periodicity has been shown for very fugacious lesions. In others there is a periodicity of one, two or three weeks, while some patients appear to exhibit annual attacks.

*Prognosis.*—This is a good as regards life, the only danger being from edema of the glottis. For recovery the prognosis is not good, for while individual attacks yield of themselves or to surgery, relapses cannot be prevented, and may last a lifetime without any way abridging life's duration.

The risk, however, has not been so minimized by some writers. Thus Whiting shows by statistics that the disorder is not only a familial disease to a large extent but that a third of the cases are killed by the disease itself caused by obstruction of the larynx. In one family of nine members in three generations eight were afflicted and five died of edema of the glottis. This tragic outcome of the disease in Whiting's analysis is not without substan-



tiation in other observers' experience. Subjects who are attacked in the lips must be prepared for attacks lower down in the mouth and throat. As in laryngeal crises in tabes, those liable to involvement of Quincke's disease in or about the larynx or while the disease is in or about these parts, should either wear a tracheotomy tube or have one near at hand for instant use by the nurse or attendant in case of necessity.

*Complications.*—Urticaria, being an affection which in extreme and atypical forms may hardly be differentiated from Quincke's disease, may be regarded from one point of view as an allied phenomenon, from another as an expression of a common condition, which may coexist with its fellow affection. Typical urticaria presents no resemblance to Quincke's disease, but the giant wheals, and the edematous lesions are closely allied at the least. Urticaria considered as an entity in its familiar forms has about the same causal factors as Quincke's disease; and lesions typical of both diseases have undoubtedly not only existed but coexisted in the same patient. Typical urticaria lesions are hot, red and itchy, while typical circumscribed edema is pale, cool and devoid of abnormal sensations; but these qualities are sometimes interchanged. In some cases of acute circumscribed edema it is possible to set up urticaria factitia. The literature of the association disease is considerable.

Cassirer saw a case of associated urticaria and Quincke's disease with acroparesthesia superadded, and gives no other instances. Several observers have seen typical Raynaud's disease with Quincke's disease, but in others the former is only suggested by coldness of the extremities or acroerythema upon exposure. In a very few cases patients presented a sort of hybrid of the two affections, making diagnosis difficult. As already stated, Quincke's disease has sometimes exhibited paroxysmal hemoglobinuria with other vasomotor phenomena also seen in Raynaud's disease. Mixed and transition forms of Quincke's disease with purpura have been noted.

*Pathogenesis.*—Much speculation as to the nature of this affection has been published. Is it a disease entity or only a syndrome? This question cannot be answered categorically. It probably may be both, but is much more frequently a syndrome. Two groups may be isolated: 1. Of toxic or autotoxic or infectious origin, behaving throughout like an infection or intoxication and with no tendency to recurrence. This form has much in common with urticaria and purpura. 2. The other

form is a familial or inherited eminently recurring affection, bearing the insignia of a neurosis, the attacks being independent of external causation.

*Diagnosis.*—In most cases this is not difficult. The sudden onset, the sharp contour, the absence of discoloration and itching and of pitting or pressure, the multiplicity of lesions, the recurrence, the nervous substratum, the sudden disappearance and the internal symptoms all serve to identify it.

The differentiation from urticaria on the one hand, and other acroneuroses on the other, has been sufficiently dwelt upon.

It is important to determine if the affection is merely an appanage of some more serious condition, either a disease of the central or peripheral nervous system, or of malaria or other systemic affection. By far the most important association is with hysteria, for we know the latter affection presents at least two common forms of edema, the "white" and the "blue," while a "red" edema is mentioned by some. These hysterical edemas are doubtless variations of one condition, the color being due to adventitious circumstances; the blue being cyanotic and the red form due to warmth. These swellings are mostly unilateral and seated in a limb. There is no marked circumscription, and the edema is usually associated with hysterical contractures in the same limb, and does not tend to rapid disappearance. Hysterical edema seldom affects the face, and probably does not occur on the mucous surface. It may be generalized over the surface. Despite these marked differences, some authors despair of any certain criterion of differentiation. The source of confusion lies chiefly in the neuropathic substratum of both conditions, and the consequent possibility of mixed and transition forms. There seems no doubt that in hysteria a form of angioneurotic edema may occur as a result of suggestion and that it may disappear through the same agency. Quincke's disease in its more typical behavior may also occur along with frankly hysterical phenomena in exquisitely hysterical subjects. The edemas in the limbs which present areas suggesting the implication of spinal cord segments are difficult to classify, but seem eminently chronic and hence unlike any of the preceding types. Of late years cases of congenital and inherited, permanent edema have been described (Milroy's disease\*). This is an

\* Milroy of Omaha has described cases of hereditary edema, twenty-two individuals in six generations, in which there existed from birth a solid edema of one or both legs, without any special inconvenience or any progressive increase of the disease.

exquisitely familial affection, and incurable. It affects the lower extremities below the knees and pits on pressure. Osler regards this, however, as angioneurotic edema. Margi describes a similar condition, a familial affection which, however, is not congenital. He would term it "chronic hereditary trophoedema." Other authors have isolated special forms of edema which have been seen in paralyzed parts and after erysipelas, and in syphilitics. Of all this group, however, the one deserving most mention and probably the only one worthy of detailed description is the transitory swelling seen in various conditions which are held to be rheumatic in nature. Erythema nodosum, occurring as it often does in large, firm, circumscribed swellings on the limbs, should in theory, be somewhat like Quincke's disease. As a matter of fact, however, it is readily distinguished, because it does not present a great variety of type and even in doubtful cases the color-play seen during the subsidence of a lesion, which resembles that in a bruise, and is due to some extravasation of blood is like nothing seen in Quincke's disease. Another so-called rheumatic affection is the subcutaneous rheumatic nodosities of French authors. These are not transitory (although sometimes they may be made to disappear for a time by manipulation).

*Treatment.*—Little is to be said under this head. General management should resemble that recommended for urticaria subjects, viz.: attention to the diet and state of the stomach and bowels. Some authorities treat patients as if their disease was a manifestation of lithemia with alleged good results. Others, basing their opinion on the presence of indicanuria, prescribe in addition to intestinal hygiene, intestinal antiseptics. Collins warmly recommends strychnia as a tonic, while of other drugs praised by various men are atropin, arsenic, quinin, iron, bromides, iodides, ergotin, sodium salicylate and antipyrin. Only in cases of edema in the faucial or glottis region is scarification or tracheotomy sometimes required.

† As for physical remedies—massage, hydrotherapy and electricity—they have been freely used in perhaps all possible forms with questionable results. Faradism is evidently much preferred to any other current, and warm dry or moist baths, etc., to cold applications.

#### RAYNAUD'S DISEASE.

Raynaud's disease may be considered as a chronic vasomotor neurosis attended by vascular changes without organic disease



of the vessels. It is chiefly seen in the extremities but it may occur in the abdominal viscera. The disorder should be diagnosed as a disease only in those cases in which the presence of necrosis due to obliterating arthritis, post febrile or multiple neurotic gangrene may be excluded. It exists as an accompanying syndrome in many chronic nervous and vascular disorders.

*Etiology.*—Women are more predisposed to it in an average proportion of about 2 to 1. All statistics bear out this statement. The reasons are obscure. Cassirer does not bear out Monro in explaining the preponderance by hysteria.

The age incidence seems fairly constant for each decade, but as cases multiply the greatest incidence appears at the third decennium, while the first, second, fourth and fifth give about the same incidence; the percentage decreases steadily thereafter, but this may be due to the decline of life in general.

In Cassirer's collection of 168 cases a relatively large incidence in the first five years of life is shown. If we proceed by quinquennial periods, this first one will be found to present more cases than any other (no less than twenty-two in a total of 168).

The relative frequency of the disease is a matter of some obscurity because some statistics comprise doubtful or imperfectly reported cases. Thus as early as 1895 two Italian authors had alleged records of 300 cases. Monro about the same time could find but 180 cases which passed muster. Cassirer in 1901 could collect but 168 well-reported and typical cases, and thought there might be 200 genuine cases at the most. Severe cases are clearly very rare, while mild cases will probably be found to be much more frequent.

The same local causes appear as in acroparesthesia and erythromelalgia, such as prolonged or constant exposure to cold and wet. A neuropathic substratum is particularly in evidence, ascendants and collaterals over and over again exhibiting psychoneuroses and psychoses, severe neuralgias, alcoholism, etc. Raynaud's disease itself may be ranked with the hereditary and familial diseases as it has been noted on numerous occasions in more than one member of a family. In some of these, typical Raynaud's disease was apparently replaced by scleroderma, progressive amyotrophy, nail dyatrophies, dead fingers, etc. This neuropathic and hereditary element, however, will probably not be found in more than 15 or 20 per cent. of all cases.

Anemia and chlorosis seem to stand in a causal relationship in a small proportion of cases.



As in acroparesthesia, the sexual life of woman plays a causal rôle but it is evidently a mild one consisting principally of suppressed menses observed in a small number of cases.

Psychic overexertion and excitation appear to have precipitated some attacks.

To return to local influences, the supposed connection between chilblains, frostbites, etc., on the one hand, and Raynaud's disease on the other has largely been exploded. But possibly 12 per cent. of all cases have begun after some exposure to cold. Some authors have gone to the extreme of disbelieving in all thermal influence in etiology. In a few instances exposure to heat has been accused.

The most important etiological factor is the nervous predisposition; for while severe neuropathic disease or inheritance is the exception, most patients would be classed as nervous, as shown also by the predominance of woman patients, the numerous cases in young children, etc., etc.

*Symptomatology.*—There are two, perhaps three, stages to the malady. First vasomotor including sensory symptoms and second trophic disturbances—necrosis of a peculiar character. A third stage is represented by exfoliation and healing of the necrotic area.

The first or vasomotor stage exhibits two types, viz.: local syncope and local asphyxia. The first consists of a sudden blanching and coldness of the fingers, toes, tips of ears and nose. The appearance varies considerably, and numerous distinct shades have been noted including waxy hue, greenish, bluish or reddish tints, etc. Cadaveric white appears to represent the type. Sometimes the white may be described as chalky or "alabaster." The lowering of temperature may amount to 20° C. by the surface thermometer. The combined pallor and coldness give realism to the designation "dead fingers" which, as will be seen, may also feel numb to the patient.

The sensory troubles include both paresthesiæ and pain and vary with the case. The sensations may precede the vasomotor disturbances and are usually aggravated when the latter appear. There are no true motor disturbances, only a sort of clumsiness and a slight tendency to flex the fingers because the pain is less in this position.

The paresthesia include numbness and formication, tingling, and others difficult to describe. Cases have occurred in which

all sensory symptoms were absent. Slight secretory disturbances may be present in the form of cold sweats.

These vasomotor and sensory phenomena occur as crises, or paroxysms. They may be very transitory, but usually last for minutes and at times for hours. There may be no reactive phenomena, but a distinct reaction characterized by heat, redness and burning or pricking is common.

But aside from constituting the first stage of Raynaud's disease, local syncope may occur independently of the latter. It has been seen in the neuropathic, and in the course of various intoxications. It may also occur with emotional states in the healthy. It may be called forth merely by cold morning ablutions, and overuse of the fingers in sewing. This is also true of other extremities. Pallor of the tip of the nose may occur from anger or excitement.

The other type of the first stage, viz.: local asphyxia or cyanosis naturally shades into the first, but when well developed is characterized by dark discolorations of various hues from light blue and gray to black. The color may be continuous or marbled in appearance. In some cases the color is translucent, in others opaque. The border may be sharply defined or the reverse. Hence the appearance of the extremities varies extremely with each case. Upon pressure the dark areas become white and remain so for a considerable period.

Local asphyxia is associated with swelling and lowering of temperature. The increase in size from swelling has been accurately measured, and amounts to some 8 millimeters for a finger or thumb. This swelling is not due to ordinary edema but is a vasomotor phenomena akin to angioneurotic edema. The local asphyxia like local syncope occurs in paroxysms, so that the swelling usually accompanies one of the latter; but it may also precede or follow it or even be present without it as an equivalent.

The lowering of temperature in local asphyxia varies much, and on the whole appears to be less evident than in local syncope. The average of many measurements shows a fall of some  $13^{\circ}$  C.

A drop of blood obtained from a finger during a paroxysm resembles venous blood. The blood state in general in Raynaud's disease will be discussed later.

Atypical phenomena occur which cannot be brought within any general description. Instead of local syncope or asphyxia, active hyperemia has been noted and such cases naturally

suggest erythromelalgia. Active hyperemia may also represent a reaction phenomenon after a paroxysm of local syncope. Again, the two opposite phenomena have in rare instances coexisted in a single extremity as "dead fingers" with heat and redness of the palm. Transitions between the first stage of Raynaud's disease and the other acronoses like scleroderma, acromegaly, angioneurotic edema, erythromelalgia and acroparesthesia have all been noted.

The paroxysms of asphyxia or syncope recur for a variable period, but ultimately there is a tendency to localized persistence. In the more typical cases a small area of gangrene appears, with or without the previous formation of a bleb. Only exceptionally is a large area involved at the start, in which case the entire terminal phalanx may slough. The gangrene is essentially an extremely symmetrical process affecting the corresponding structures on the two sides but exceptionally the process shows asymmetry. The symmetry is probably never absolute, *i.e.*, the gangrenous spot shows a variation on the two sides even if the syncopal areas correspond closely.

The total area involved varies greatly. It may be limited to the tip of the nose, to the ears, to individual fingers and toes, and at the other extreme we may see involved all the digits with addition of ears and nose. Between these extremes we find all variations. Monro's analysis shows that in 43 per cent. one or both hands were involved, in 28 per cent. one or both feet, and in 22 per cent. both upper and lower extremities. Cases involving the entire extremities inclusive of nose and ears are very rare.

In a small atypical series of cases the gangrene has been extensive, attacking entire segments of the extremities, and demanding amputations in continuity. Naturally it is not easy to bring such cases into conception of Raynaud's disease but good diagnosticians have described such cases. Instances where a hand or foot has been compromised are somewhat more common and more readily recognized, but even here careful differentiation from other forms of gangrene is required.

Rare implication of other organs not usually recognized as extremities has been noted. Thus even an organ like the tongue, with an active circulation and protected from the cold, has exhibited phenomena of syncope, asphyxia and even gangrene with paresthesiæ which, by exclusion was diagnosticated as Raynaud's disease. The lips, chin, eyelids, nipples, buttocks,



sacral region, vulva, etc., have been similarly involved. Naturally the diagnosis in such cases could not have been established save by the coincidence of Raynaud's disease in the customary localizations. No doubt, however, some of the cases of this sort reported and which have swelled the material of some case collectors were never Raynaud's disease but multiple neurotic gangrene, diabetic gangrene, etc.

There are other trophic disturbances of the extremities besides gangrene, most of which are of the nature of scleroderma (sclerodactyl). The number of cases of typical Raynaud's disease with sclerodactyl is constantly increasing. Aside from sclerodactyl there is sometimes seen a sort of hypertrophy of the subcutaneous tissue of the digits. This has been termed pseudcedema. The synovial sheaths in the digits have been known to participate giving rise to erudation and eventually contracture. In some cases the enlargement affects all the tissues, involving the entire hands and feet, thereby illustrating the transition between Raynaud's disease and acromegaly. Nail dystrophies have often been noted and have shown much variety, including both hypertrophic and atrophic changes. Of late atrophy of bone has been shown in some cases by radiographs.

Of interest is the relationship between Raynaud's disease and panaritium, the latter apparently representing a chance infection of a very vulnerable soil. In some few cases the felons have been multiple. The most striking peculiarity of these felons is their occasional painlessness, which at once suggests the painless felons seen in syringomyelia or Moran's disease.

Concerning the *objective sensory disturbances*: To recapitulate the subjective aspect, it is recalled that pain of a more or less severe character is associated with tactile anesthesia. The pain may be as severe as in erythromelalgia, and there is subjective numbness, lancination, burning, etc., followed by formication, tingling and other paresthesiæ.

Since the manifestations of the disease represent paroxysms or crises, the sensory phenomena are also paroxysmal, being more severe and frankly painful as the basic condition increases and changing their type during the reactive period. The sensory disturbances increase as the paroxysms become worse and finally as the gangrene stage is reached become intolerable. Sensitiveness to pressure accompanies the pain.



But the crises of the pain do not always conform to the vascular crises. Not only may they vary exceedingly but in some cases painful phenomena are slight and even absent.

The painful phenomena are quite distinct from definite areas of innervation.

Objectively anesthesia or hypoaesthesia is usually present. Anesthesia is revealed in some foot cases by an atactic gait. Anesthesia seems to be more marked in syncope than in asphyxia but exceptions occur. Anomalies of temperature-sense vary. Thus in one case both hot and cold objects seemed warm. Every case seems to be more or less a law to itself.

There is some conformity between the sensory disturbances of Raynaud's disease and those of syringomyelia, both showing a marked tendency to dissociation of the various sensibilities.

Objective sense disturbances may be wholly absent in Raynaud's disease.

Secretory disturbances when present are confined to local hyperhidrosis. Motility disturbances, very rarely present, are connected with amyotrophy of the interossei and palm muscles of the thumb and little finger.

Other alleged symptoms may be discussed as complications and under diagnosis.

*Course and Complications.*—The characteristic feature is recurrent paroxysms. The latter begin with local asphyxia or local syncope, often conjoined in the same extremity. The paroxysms themselves occur in a cycle so to speak. During a cycle a certain number of paroxysms occur, and a cycle may last from a few days to a month. The duration of a paroxysm also differs widely, from a quarter hour to as long as thirteen hours. Syncopal attacks may be more fugacious than asphyxia attacks.

The cycle is succeeded by a period known as the status, which lasts a number of days (Raynaud made it about ten days) after which gangrene sets in. The period required for the development of gangrene and healing after it, added to the onset cycle and period of status, occupy from three to four months. The period of status is characterized by the severe pains of the affection. According to some analyses, about three-fourths of all cases consist of but a single attack during the cycle of invasion, this being continuous and passing into gangrene.

Not all cases undergo the progressive evolution outlined above, for some on record show that attacks of asphyxia or

syncope simply recur for months or years with no disposition to lead to an *état de mal* or gangrene. Such cases consist of recurring cycles of paroxysms only. Thus in one case there were periods of quiescence of two years. At the other extremes gangrene has supervened a few days after the earliest symptoms and such *fondroyante* cases have led to death.

Intense syncope has been known to persist for twenty-four hours without producing gangrene.

It is a question whether or not certain cases of chronic cyanosis of digits represent a form of Raynaud's disease.

Local syncope has been known to produce gangrene without any asphyxia preceding. Symmetrical gangrene of digits has developed without any previous asphyxia or syncope. Attacks of syncope or asphyxia have been known to persist for years and ultimately lead to sclerodactyl without gangrene.

If we regard all of these variations in course as within typical bounds, it must be admitted that cases are multiplying in literature which depart still more widely from even such a broadly conceived type-range. One clinical type is that which has often occurred after acute infectious diseases, and nearly all of the latter have been represented here. Sometimes the disease develops in the convalescent period when one naturally thinks the postinfectious anemia is responsible but in other cases weeks and months have elapsed, and coincidence must be invoked. Some severe cases of postinfection have been due to thrombosis of peripheral veins. Many clinical variations have occurred, such as gangrene of tip of nose following diphtheria. There were also lesions on some of the digits and tip of tongue.

There seems an undoubted association between malaria and Raynaud's disease, not only as shown by personal histories, but perhaps in the marked periodicity of some cases. In some cases local asphyxia corresponds to the algid stage, while fever and the stage of local reaction conform to each other, but this is by no means typical. In malarial countries where the disease is epidemic however, gangrene is but seldom noted. Occult malaria is sometimes associated with Raynaud's disease (enlarged spleen, leukocytosis, etc.).

Raynaud's disease has often developed in people who are victims of some chronic disease—tuberculosis, syphilis—the latter of special interest because it is known to cause vascular disease. It is also seen with diabetes, Bright's disease, hemoglobinuria, etc. The paroxysmal character of the latter often conforms

to the course of Raynaud's disease and the association of the two in the same patient has often been noted. The two affections do not occur with equal severity, but rather the contrary—if one is severe, the other may be mild. The literature of the relationship between the two affections is extensive. If we begin by studying the two independently we will find that a line of demarcation is hard to draw. Each study leads to the other. Some authors conclude that the two are manifestations of one basic disease. Others invoke the vicious circle—one process can set up the other, etc. Not less remarkable is the frequent association of Raynaud's disease with albuminuria, the latter either functional or due to nephritis. Intermittent albuminuria is not usually the most interesting type in this connection. The simple cases of "dead fingers" often noted in nephritis also suggest themselves in this connection. Raynaud's disease should naturally be favored by the cardiovascular disease associated with fibroid kidney but it also accompanies or follows ordinary nephritis.

Another interesting association is with glycosuria and diabetes, the latter a condition so predisposing to gangrene.

In perhaps 12 per cent. of all cases of Raynaud cardiovascular disease of some kind has been noted—valvular lesion, arteriosclerosis, etc., etc. Here we again come to the relationship of the disease to lues and nephritis. It has been noted in tertiary and late hereditary syphilis. A necessary causal relation between cardiovascular disease and Raynaud may be assumed for a certain per cent. of cases.

An equally significant relationship has also been established with organic disease of the central nervous system—hemiplegia, hydrocephalus, tumor, sclerotic change, etc. The analogy of syringomyelia has already been noted, and the shading into one another of the various acro-diseases has also been alluded to from time to time.

Finally coincidences of Raynaud's disease with supposedly vasomotor paroxysmal affections elsewhere in the body have often been noted. Here belong epilepsy, chorea, urticaria, Basedow's disease, etc., etc. Raynaud's disease, however, may be associated with almost any neurosis or organic nerve lesion, thereby showing only neuropathic substratum. ☞

*Pathology.*—This literature is very extensive and controversial and we can do no better than cite the conclusions arrived at by Cassirer:



Vasomotor and trophic paths and centers are rendered more irritable than normal by conditions both predisposing and exciting, general and local. In the absence of a causal nevus, certain toxic agents are able to produce the same syndrome in the healthy or in the absence of other factors.

The same causal elements at work here can also produce the other vasomotor affections of the extremities and the closest connection exists between Raynaud's disease and acroparesthesia, erythromelalgia, sclerodermia, acute circumscribed edema and multiple neurotic gangrene of the skin.

*Diagnosis.*—Atypical and abortive forms present marked difficulties in diagnosis. So numerous and varied are the transitions between Raynaud's disease and the other affections of the same group that confusion here very readily occurs. Acroparesthesia, for example, has a syncopal variety, while Raynaud's disease may stop short of gangrene, and also may sometimes be unaccompanied by much pain.

In localization, sudden onset and extreme pain, Raynaud's disease confirms with erythromelalgia, and sometimes exhibits redness instead of duskiness. Aside from these analogies, however, there should be numerous points of difference. In erythromelalgia the local temperature is raised and the congested parts feel warm; further, when the limb is elevated the redness disappears. In Raynaud's disease the local temperature is lowered and the part feels cold and does not pale out when elevated. Erythromelalgia has no analgesic and anesthetic symptoms for sensibility is retained or increased; whereas in the paroxysms of Raynaud's disease anesthesia and analgesia are present.

Nevertheless cases have occurred in which differentiation was impossible. This is also true of sclerodactyl.

Next to erythromelalgia Morvan's disease requires the most careful differentiation. Here transition forms occur, although in the main syringomyelia begins insidiously and lasts for many years, having no paroxysms. While it may eventually attack a number of extremities, it tends to affect a single one at first. In syringomyelia we do not see gangrene but painless felons, multiple and tending to recur but as already stated not as part of a crisis. In syringomyelia there is dissociation of the sensory phenomena and amyotrophy is common; but exceptionally we see these in Raynaud's disease. Syringomyelia may end in perforating ulcers, exfoliation of phalanges, etc. In syngo-



myelia the fingers may be cyanotic and cold but the deeper shades of color are not seen and the coldness is continuous.

The changes in the extremities associated with peripheral neuritis may simulate Raynaud's disease. This is seen especially in diseases like beri-beri and anesthetic leprosy where polyneuritis is part of the symptom complex but confusion with such affections becomes the more unlikely. With simple peripheral neuritis confusion may sometimes result, both diseases seeming to coexist. A few cases of Raynaud's disease seem to depend on neuritis. Hysteria approaches the picture of Raynaud's disease in more than one symptom-complex. Thus the blue edema seen at times in the hysterical may require differentiation from the asphyctic stage of Raynaud's disease, just as hysterical gangrene may simulate the gangrenous stage. Both blue edema and gangrene have occurred together in the same hysteric.

Records show that congenital lesions of the heart may be confused with Raynaud's disease when symptoms of both affections coexist. In the heart lesion we see cyanosis of the fingers and trophic disturbances.

All forms of gangrene of vascular origin may simulate Raynaud's disease. This is true of senile gangrene, for Raynaud's disease may begin at an advanced age and senile gangrene may be presenile. While senile gangrene naturally progresses, often demanding amputation, it may evolve slowly, attacking the digits in succession, and the eschars may be small and undergo spontaneous cure. Hutchinson was puzzled to make a diagnosis in one case, but finally decided in favor of senile gangrene, although the fingers were affected worse than the toes. In typical senile gangrene the fingers are not affected at all.

In endarteritis obliterans, with demonstrable lesions of large vessels there are painful and paresthetic sensations, coldness and pallor or lividity and if thrombosis occurs gangrene supervenes. Authorities state that the gangrene here is seldom or never symmetrical, and is further progressive and of fatal tendency. When the endarteritis is evidently due to a toxic principle (syphilis) confusion is still less likely. Numerous cases in literature reported as Raynaud's disease seem from the character of the gangrene to have been of purely vascular origin.

When endarteritis is of such degree or type as not to present gangrenous tendencies, it may manifest itself as intermittent limp, a condition already differentiated from acroparesthesia. But vascular symptoms may be marked with intermittent limp,

and the paroxysmal character of the latter suggests the presence of a vasomotor factor; while as already stated elsewhere a certain proportion of cases of intermittent limp are probably wholly functional in character and due to crisis of angiospasm, which, however, are usually precipitated by voluntary motion (walking, etc.). It is not surprising therefore that anomalous Raynaud's disease when limited to the lower extremities may sometimes be indistinguishable from intermittent limp.

Gangrene of the extremities from embolism or thrombosis of large vessels can hardly be confounded with Raynaud's disease, but both conditions occur under the same circumstances, as during convalescence from fevers, etc. No doubt some cases of alleged Raynaud's disease have been due to the other malady.

The phenomena most characteristic of Raynaud's disease have been simulated by ergotism. To such an extent is this true that Ehlers seriously advanced the view that Raynaud's disease must be due solely to ergot poisoning of some sort. We do not know enough of the pathology of ergotism to contrast the two affections entirely, and can only state the drug can produce angiospasm and gangrene.

To what extent pure cold can cause Raynaud's disease has been a mooted question. Cold can cause gangrene of extremities, and as a milder lesion the well-known chilblains. The latter have frequently preceded the evolution of Raynaud's disease. Unna places lesions due to cold among angioneuroses from the mechanism of their production.

*Treatment.*—Much may be accomplished by prophylactic and general measures in cases with recurrent crisis. All measures are indicated which tend to increase the general well-being, especially measures against anemia, neuropathy, etc. Local insults from cold, overexertion of extremities, etc., must also be guarded against. Southern residence is sometimes necessary.

In regard to actual treatment electricity holds out the most hope. It should be applied to the spine as a corrective to the irritable weakness of the affected nerve-paths. However, the supposed efficacy of this resource for preventing gangrene is offset by the fact that not all cases end naturally in gangrene. Either the galvanic or faradic current is used, with the affected extremity in water. The constant current may also be passed through the affected limb alone. Some clinicians combine all possible methods of electric treatment upon the same patient.

Amyl nitrite and the nitrites in general have been used exten-

sively as vasodilators, including nitroglycerin. Atropin and pilocarpin have also been used to this end. Many, however, regard these remedies as both useless and dangerous.

Hydriatic procedures have been used very extensively, and of various kinds and degrees, but there is no consensus of opinion as to which is preferable. Ice to the elbow sometimes overcomes the vascular spasm of the fingers. Dry warm and warm moist heat as well as dry hot air are all recommended, but some patients do better for cold applications. Gentle massage and embrocations of oil, etc., seem to give relief, especially when clumsiness of the fingers is present.

Derivation, such as is obtainable from a mustard bath, is said to benefit the asphyxia, but Raynaud records a case in which the latter was much aggravated. It would seem in theory that the affected extremity ought to remain outside the bath.

Anodynes are naturally required to the same extent as in erythromelalgia. Relief sometimes follows coal-tar derivatives as antipyrin, eutipyrine and phenacetin. Others require opiates, chiefly morphine, although belladonna, cannabis indica, etc., should be used first, or alternately.

Of internal remedies used are quinin, ergotin, iodothrinall in the hope of meeting some definite causal indication, with iodide of potassium in arteriosclerosis and syphilis. Gangrene must be managed chiefly on the let-alone plan.

#### ERYTHROMELALGIA.

Erythromelalgia may be defined as a chronic vasomotor disorder characterized by pain, flushing and heat usually in one or more extremities, or other parts of the body, in which the symptoms are made much worse by depending the parts involved. The disease was first fully analyzed, described and named by Weir Mitchell. The name signifies a painful redness of a limb. The disorder needs to be sharply limited to that type of vasomotor neurosis with the features above given, a small but perfectly definite group of cases.

*Etiology.*—It is a rare disease (not more than a hundred cases are on record) of early adult life and is most frequently caused by exposures to wet or cold or both and overexertion. The influence of sexual life in women, as notable in acroparesthesia, is absent in erythromelalgia. The frequency with which the



extremities are involved is inverted in the two affections, for while essential acroparesthesia is practically a disorder of the upper extremities alone or with some participation at times of the lower extremities, erythromelalgia was believed for some years to be peculiar to the feet and legs. The constitutional and toxic factors believed to play some part in the causation of acroparesthesia are even less in evidence in erythromelalgia. Neuropathy seems to play no rôle and of the other possible factors such as rheumatism and syphilis (Ludgarten), malaria, alcohol, etc., it is doubtful if the incidence of these is any greater than in a series of individuals taken at random (Sachs).

*Symptomatology.*—The tenderness, pain and redness of the limbs which the name of the disease implies, are naturally the cardinal symptoms. As the paresthetic sensations in acroparesthesia sometimes merge into actual pain, so the pain in erythromelalgia is sometimes preceded by, associated with, or replaced by sensations of formication, tingling, numbness, etc. The pain is quite characteristic, tending to increase progressively until it becomes almost unendurable. Some authors reckon it to be the most extreme form of pain known. It has an exacerbating character with or without complete remission and is especially aggravated by gravity, warmth and active exertion. Hence posture and cold are instinctive remedies. The cold of winter, however, does not bring relief, for usually the affection is aggravated at that season.

The redness does not occur synchronously with the pain, nor does it contribute in any way to the latter, for the pain as a rule precedes the congestion, sometimes even for days and weeks, during the evolution and exacerbation of the disease. In very rare cases the redness has antedated the pain. But in certain fugacious types of the disease there has been a brief coincident appearance of pain, redness and swelling. It seems reasonable that the redness may cause or aggravate sensations of heat and burning only. The congestion at the outset bears all the marks of active hyperalgesia and only gradually and after some time is this transformed to passive congestion with the bluish, cyanotic hue. The hyperemic areas are only exceptionally characterized by a well-defined margin. It pales out under pressure.

The third symptom in order of importance is swelling, which, however, is not constantly present. It is associated with active hyperemia and is a transitory phenomenon constituting a sort of



crisis. As part of the latter may be reckoned the objective rise in surface temperature of the extremity which has often been measured and has even been known to reach over  $4^{\circ}$  C. as compared with an unaffected limb. In the cyanotic stage there is conversely a lowered surface temperature.

Erythromelalgia is distinctly a paroxysmal affection, although individual paroxysms may last for a long time, and some cases may show no complete intermission. The paroxysmal character is also masked somewhat at times by the effects of the secondary features and by remedial measures.

The painful sensations which really constitute the disease are most frequently felt in the feet and in the toes first. The hands are attacked about half as frequently, and in a fair proportion of cases all four extremities are involved, while on rare occasions we see hemiplegic and alternating types. In a solitary case the ears were involved. The pain may begin in a single digit or all the fingers of one hand, or in the ball of the hand or foot, palm or sole, but in any case there is a disposition to generalization, with lower extremity as high as the knee and in the upper extremity along the forearm. The area of redness seldom coincides with that of pain, but is usually less. When the disease occupies two or more extremities, one is usually attacked first in a paroxysm, and there is a definite precedence in the same individual. From all that has been written upon the subject it is evident that the vasomotor participation in erythromelalgia, unlike that in acroparesthesia, is constant and not exceptional, but even in this constancy there is an element of dissociation, so that pain may occur for a considerable time without redness, and *vice versa*. There is further want also in extent and severity. There is, however, no ischemic stage or condition in erythromelalgia, this being replaced by cyanosis.

The objective signs still need to be considered. There is an augmentation of general and tactile sensibility so that during paroxysms the weight of the bed clothing, etc., is burdensome and patients cannot tolerate their shoes and stockings.

Coincident local hyperidrosis has been noted in a minority of cases and sometimes appears only when patients exert themselves, while at others the outbreak of sweat seems associated with the crises of pain, redness and swelling. In a few cases the sweating is not paroxysmal but continuous. The area of sweating conforms to that of the redness and swelling. Trophic changes have been noted in about a third of all cases. Thicken-

ing of the skin, especially that of the finger-tips, including nail dystrophies, has been remarked occasionally, and in several patients the condition resembles the drumstick fingers of the tuberculous and other chest disorders. More frequent is atrophy of the glossy skin type such as follows injury of the peripheral nerves. The transition from hypertrophy to atrophy may sometimes be observed but atrophy is usually primary. As already implied in the allusion to drumstick fingers, trophic changes are sometimes seen in the bones.

Certain cases have been reported which appeared to represent a transition between erythromelalgia and Raynaud's disease. Thus Sachs states that the association-disease is not infrequently seen and the influence of malnutrition, premature arteriosclerosis and peculiar occupations is apparent. Erythromelalgia has been accompanied by other affections of supposed vasomotor origin, and has been found associated more frequently than chance would account for with tabes, disseminated sclerosis and central tumor. But all attempts to make of it a disease of central origin have failed. The same may be said of attempts to connect it with nerve roots of peripheral nerve distribution. In numerous cases there has been an evident correspondence between the erythromelalgia area and some peripheral nerves, but even in such the nerves have been intact.

*Pathology.*—Only of recent years have pathological specimens been available and these have given conflicting testimony regarding the pathogeny of the disorder. Numerous theories have been advanced to account for the affection. Oppenheim and his school regard the local symptoms as evidence of irritation of certain sensory, vasomotor and secretory tracts and centers, but the exact site of the irritation and the nature of the irritant remain unknown. The opinion is steadily gaining ground that erythromelalgia is a syndrome rather than a disease *per sé*. This view, in many cases at least, would explain its occurrence with central nervous affections such as tabes, disseminated sclerosis and tumors and also its not infrequent association in certain other cases with peripheral nerve distribution, radicular distribution or spinal metomeres. Sachs has shown that Raynaud's disease and erythromelalgia may not only coexist but that in some cases the initial pathogeny of the two affections is not dissimilar. If there be a distinct diseased state it is seen in those diffused cases which affect all or most of the extremities. We may therefore speak provisionally of a symptomatic

and essential erythromelalgia, the first dependent on irritation of peripheral vasomotor apparatus, especially vasodilator and secretory nerves. The sensory fibers always participate. The essential variety, on the other hand, must originate in central irritation, which is probably spinal or bulbar. The same nervous paths are irritated and trophic disorders frequently coexist as above stated.

*Diagnosis.*—We have to contrast other affections from a condition which combines active hyperemia, redness, swelling, severe pain and opportunely secretory and trophic disturbances and which occur in paroxysms in a definite localization—usually the extremities of the limbs. Other affections may show the vascular phenomena alone, or the pain alone, while the extremities are subject to a variety of trophic disorders. Not a few conditions may simulate erythromelalgia as a whole.

A condition much like erythromelalgia has been described as acrodynia and epidemic erythema. The redness of the extremities, the pains and paresthesiæ might readily simulate erythromelalgia, but the epidemic affection has been recorded but a few times and in scattered portions of the world and is always accompanied by constitutional symptoms and gastrointestinal irritation. The eruption is generalized from the extremities to the trunk, and the painful phenomena consist rather of severe paresthesiæ than actual pain (hyperesthesia, causalgia) and give way later to anesthesia. The disease runs its course in a few weeks. It doubtless belongs to the same group as pellagra and ergotism.

Erythromelalgia, confined to one finger, has been diagnosticated as a felon and has been incised.

Actual structural disease (arteriosclerosis) of the blood-vessels of the extremities has simulated erythromelalgia closely. This has probably happened only as far as the lower extremities are concerned. The feet and ankles have been discolored dark red or bluish and crises of pain have coexisted. Such conditions pass rapidly to gangrene, so that the danger of a blunder is not great.

Erythromelalgia may shade into Raynaud's disease clinically. The comparison between the two affections will be made under the head of Raynaud's disease.

Intermittent limp may be associated with cyanotic color of the lower extremities and various painful sensations, chiefly upon exertion. In other instances unnatural pallor or coldness may be present. Once believed to be pathognomonic of arteritis,



the intermittent limp is now thought to be due in a small number of cases to a functional vascular spasm. If actual disease of the posterior tibial artery can be made out by palpation (induration, absence of pulse) differentiation should be facilitated. In certain cases it may be impossible to distinguish the two affections—in fact, typical erythromelalgia may coexist with the arterial affection.

Affections of the extremities characterized by congestion alone without pain or paresthesiæ are comprised under the general term *acroerythema* or *erythroderma*. *Scleroderma* may begin with a stage of redness. A symmetrical active congestion of the extremities without other symptoms has been described by dermatologists, and attributed to vasomotor irritation. The congested dorsa of the hands and feet in *pellegra* are well known, and may also be seen in various rash dermatoses. *Erythromelalgia* may exhibit redness without sensory phenomena for a short time, but study of a case should make it easy to exclude purely vascular affections.

There are numerous painful affections of the extremities not associated necessarily with vascular disturbances. Under *acroparesthesia* attention was called to the occasionally painful character of the paresthesiæ and it must not be forgotten that in certain cases of that malady vasomotor disturbances occur. True neuralgia and neuritis may sometimes be associated with erythromelalgic redness. Numerous affections which might simulate the painful sensations alone of the disease in question are Morton's disease (*metatarsalgia*), Berger's paresthesia (see under *acroparesthesia*), *akinesia algera*, and various painful affections of the feet (*gout*, *rheumatism* (*gonorrheal*), *periostitis*, *bursitis*, and conditions which can only be styled by the general term *pododynia*).

Of trophic affections of the extremities which might at some stage simulate the trophic alterations which develop at times in erythromelalgia we may mention *acromegaly* at its debut, *scleroderma* in its early stages, *myxedema*, possibly the *osteoarthropathy* of the digits seen in tuberculosis and other chronic intrathoracic affections and certain forms of *arthritis deformans*. It should be sufficient in differential diagnosis merely to bear these possibilities in mind, since confusion could hardly arise in excluding such affections. It must be remembered that the phalanges and nails seem predisposed naturally to trophic disturbances.



Finally it must be borne in mind that typical erythromelalgia has coexisted not a few times with some profound central affection. In addition to tabes, insular sclerosis and tumors already mentioned, syringomyelia, and extreme hysteria have also been recorded as coincident affections. Hence the possibility of this coincidence must not be overlooked.

*Prognosis and Treatment.*—Erythromelalgia is an exquisitely chronic affection without much range for progressiveness. In fact it often remains indefinitely at a complete standstill. In many cases, however, there has been spontaneous improvement even after years of persistence, and in a few instances the disease has been self limited after a relatively brief sojourn. The prognosis for radical cure is on the whole poor, but the prognosis for ultimate improvement is good with patience. It is impossible to state to what extent improvement is ascribable to treatment, but something to palliation is not only indicated but becomes indispensable.

Aside from the postural and refrigerating measures, which the patient and his friends will instinctively apply, systematic hydrotherapy probably holds out some further hope of relief, as do galvanic and faradic local baths. Gentle massage is of some assistance. Of drug therapeutics, local or general, everything has been tested, and we only know that morphine will relieve the pains. Data fail as to whether patients become morphinomaniacs. In theory neurectomy is indicated to put an end to the pain. Once or twice the desired result was obtained, but in other cases there was failure and in one case after extensive neurectomies gangrene developed and amputation became necessary.

#### ANOMALOUS AND UNCLASSIFIED FORMS OF VASOMOTOR NEUROSES.

*Vasomotor Ataxia.*—Many individuals possess an inherent instability of the vasomotor system known as "vasomotor ataxia" (Solis-Cohen). Probably because of the very great difficulty in elucidating the cause and nature of this vasomotor defect the affection has been much neglected. Vasomotor ataxia often appears on a neurasthenic, neuropathic or hysterical substratum. Some manifestations are physiological, as blushing and pallor from emotional causes. Hence psychic trauma readily suggests itself as a possible factor, and the influences of

fear, anxiety, etc., on disease is apparent. Traumatic neuroses become intelligible in some of their protean characters, and this is true also of some occupation neuroses.

In the class of single agencies which disturb the vasomotor equilibrium, tobacco is a familiar one, its functional and possibly organic effects on the circulatory system being well understood. When toxic substances like alcohol are discontinued after prolonged habitual use, disturbance of vasomotor equilibrium is very commonly seen. At the climacteric in women vasomotor ataxia is known to be commonly present.

*Symptomatology.*—This is naturally extensive. Manifestations of all kinds tend to be paroxysmal. Some are local throughout, some more or less diffuse. Some suggest angiospasm, others angioparesis. Not all are paroxysmal for some may be continuous. Attacks vary greatly in onset, duration and interval. Factors which determine attacks vary greatly. They may consist of mechanical, chemical, or thermal irritation, drug action, etc., aside from psychical causes. Intolerance to drugs belongs here. Some alleged toxic affects of drugs are not essential to the drug action, but results from vasomotor ataxia, so that different drugs might cause similar symptoms. Above all, individual susceptibility is a factor of greatest significance.

Such phenomena as "nervous chills," fainting attacks, "rushes of blood," vertigo, etc., are familiar examples. Naturally these crises are all prone to imitate serious affections.

Crises from colic and diarrhea—as if from angiospasm in the region of the mesenteric arteries—profuse rhinorrhea, crises of hay fever, inexplicable congestions of the conjunctiva, are familiar examples of paroxysmally occurring vasomotor ataxia.

Active conjection, active syncope, cyanosis, may all occur in the same organ and in the same individual, and more than one of these three is usually present in the same paroxysm. These naturally are to be studied to best advantage in the extremities, fundus oculi, drum-head, and visible mucosæ. The symptoms naturally closely resemble those of regional arteriosclerosis. Of subjective symptoms those of fulness, pulsation and the like naturally accompany acute congestions. Local anemia (syncope) is often accompanied by paresthetic sensations.

Congestive crises may be called forth in some individuals by using the nitrite of amyl, commonly employed for the relief of the opposite condition. Indeed, the number of drugs able to influence the vasomotor system is very large. Those once

addicted to tobacco often experience an abnormal susceptibility to it afterward, amounting to intolerance.

The ability to induce vasomotor crises in these subjects by various stimuli is often of great benefit in diagnosis of the substratum.

*Vasomotor Affections of Special Organs. Skin.*—Many “dermographs” are quite free from other evidences of vasomotor ataxia. The greatest frequency of vasomotor phenomena in the skin is doubtless only apparent because of the ease of observation. All shades of color and grouping may be seen in the skin. It is owing to vasomotor influence that eruptions can simultae each other so closely (pseudoscarlatina, pseudomeasles, etc.). One might add to vasomotor dermatoses erythema multiforme, the degree of ataxia making possible the coexistence of so many lesions. Modifications of sensibility are associated with vascular changes. Thus in local syncope and anemia, depression of sensibility exists. “Cold feet” should not be ascribed to vasomotor spasm, as many factors cooperate here. Cold sensations are felt chiefly from the feet up to the knees, in the hands and along the spine. Warmth is experienced chiefly in the face. General anemia of the skin is usually accompanied by rigors, while general hyperemia of the skin is associated with restlessness and motor activity. The alternation of general chill and warmth, so-called “nervous fever” of Bouveret, which may or may not be associated with quickened pulse and rise of temperature, is evidently a manifestation of vasomotor ataxia.

In neurasthenia we often find abnormal sensations of cold, as in the head (Binswanger). These sensations appear to be subjective and paresthetic.

*Muscles.*—Vasomotor ataxia in the muscles is largely a hypothetical affair. Paramyotonia due to abnormal sensibility of muscle to cold has been thought to belong here, so also some cases of tremor.

*Head* (including encephalon).—The entire head may participate at once, or only certain regions of it, as the encephalon. Congestive states of various kinds are very common. Surface congestion is best noted in the ears. Breaking out of sweat on the forehead is considered under secretions. In congestion of the head there is usually induced tenderness over the nerves at their foramina.

Both conjunctivitis and coryza when they pursue a paroxysmal recurring course have a marked vasomotor element, and



this form of coryza is often accompanied by nose bleed, especially in the young. Congestion in the nasal sinuses is accompanied by intense headache, and all of the sinuses may be thus affected except the antrum of Highmore. Congestive affections of the conjunctiva and nasal mucosa are especially common at puberty and in brain-workers. Nervous coryza (hay fever) may be simulated, but observers have not found that hay fever subjects have general vasomotor instability.

In regard to endocranial circulatory disturbances, the fundus oculi furnishes the best evidence. The membrana tympani also furnishes trustworthy evidence. The state of the skin is of no value. Diminished electric resistance through the head appears to bear some relation to the presence of vasomotor ataxia, but the interior of the skull does not participate here.

Functional evidences of cerebral hyperemia are seen in inability to do mental work and to sleep, while the patient has impulses to motor activity and is restless. In higher degrees an intense splitting or pulsating headache appears. Such a condition naturally may terminate in cerebral hemorrhage.

A characteristic subjective feeling in cerebral hyperemia is one of dread and insecurity, and this seems a direct result of the pulsations. Cerebration becomes difficult, and patient thinks he is losing his mind. Vertigo is present at times and conduces to agoraphobia. The symptom-complex in these cases is therefore one common in neurasthenia.

In some cases the meningeal syndrome develops, and it may follow psychic trauma. In the highest degrees of cerebral congestion we find, of course, maniacal agitation, delirium, hallucinations, etc.

Symptoms of cerebral congestion in the sense-organs include pulsation of retinal vessels, increased tension in the eyeballs, burdensome tinnitus aurium, etc. Of special interest in this connection are labyrinth symptoms—Ménière's triad of vertigo, vomiting and deafness plus tinnitus. The angioneurotic form of Ménière's syndrome is known to otologists. That in quinin we possess a drug which has power over vasomotor ataxia seems evident from its utility in this, as in other manifestations.

Cerebral anemia is much less significant as a manifestation of vasomotor ataxia. Its chief expression (Bingwanger) is in frequent attacks of fainting. So-called syncopal attacks in half the face and one arm seem due to cerebral anemia. Another set of manifestations are seen chiefly in the retina—transient



blindness, hemianopsia. To some extent vasomotor anomalies of the throat—*anemia*, *cyanosis*, etc.—have been recognized.

*Chest.*—Intrathoracic vasomotor disorders are difficult to recognize. Hyperemia of the lungs and bronchi is doubtless of common occurrence. Here belong perhaps certain forms of paroxysmal asthma or dyspnea. If the congestion is of sufficient degree, some edema of the lungs may result. The subject of cardiac neuroses, including *angina pectoris* in the functional forms, is so well known that it need not be discussed here.

*Spinal Cord.*—As in the similar case of the lungs, we surmise but cannot prove the frequency of hyperemia and anemia in the cord. Angiospasm is believed to suspend more or less the functions of the latter, while congestion is held responsible for certain neuralgiform affections. We know less by far of vasomotor ataxia in the cord and lower respiratory organs than of the same anywhere else in the body.

*Abdomen.*—Our knowledge of vasomotor ataxia in the abdominal vessels is considerable. Paroxysmal affections of various kinds, manifested in various ways, are numerous and common, as might be inferred from the number of organs and the distribution of the blood-vessels. The phenomena are vasodilator, rather than vasoconstrictor, for we know but little of the latter. Pulsation of the abdominal aorta associated with violent pain is very common in women, and is usually demonstrable objectively. Attacks occur in crises. The abdominal aorta is much increased in volume, and numerous digestive disturbances may coexist, such as flatulence, acute hunger, obstipation, etc., the crisis often ending with vomiting. The internal congestion is usually accompanied by surface anemia, often associated with eruptions of macules and wheals, purpura, edema of the feet or sweating of the hands. These attacks may last so long or recur so frequently as to constitute a *status mali*. Aside from these crises much so-called nervous dyspepsia belongs here—the sort which comes and goes without apparent motive.

Another manifestation of abdominal congestion is the so-called nervous abdominal plethora, which may develop in the absence of any mechanical obstruction in the portal circulation. It is chiefly in evidence in the liver and appears due to a complete abeyance of normal vascular tonus. In this plethora, as distinguished from the pulsating arterial crisis, the symptoms are those of stasis, and the affection therefore can the more readily become chronic. Among the functional anomalies pro-

duced are stasis catarrhs, pseudohepatic colic, etc., and areas tender on deep pressure are often recognizable.

The corresponding angiospastic affections of the abdomen are probably manifested chiefly by congestions elsewhere, as by "hot flashes" and "rushes of blood to the head."

*Urogenital System.*—Vasomotor ataxia in the female, as affecting the reproductive organs, may be in part summed up under dysmenorrhea in its widest sense, together with certain symptoms ordinarily indicative of metritis. Here belong many phenomena of the climacteric and perhaps gestation. Suppressed menses as well as menorrhagia may be purely vasomotor in character. To vascular disturbances in the uterus must be added others of the same character in the ovary, tube and parametrium. In man the only analogous phenomenon, perhaps, is irritable testis. Naturally gynecological vasomotor pathology stands in close relationship to nervous abdominal plethora.

*Extremities.*—Vasomotor ataxia here is manifested chiefly in the various affections about to be described as acroneuroses. Another well-known manifestation is "functional intermittent limp" due to angiospasm in the muscles of the lower extremities. It was Lister, we believe, who first showed that the anemia caused by elevating the arm was due to angiospasm rather than to gravity. Numerous other physiological phenomena of vasomotor mechanism may be produced in the extremities.

In addition to the preceding phenomena, authors describe a "regionary cyanosis" which is largely summed up under the head of Raynaud's disease in its common and rare forms. The superaddition of edema, extravasation, etc., is largely covered by the subject of acute angioneurotic edema and certain paradoxal hemorrhages.

While vasomotor ataxia is chiefly paroxysmal, and inclined to show itself in certain syndromes, it may be at the bottom of strictly localized and chronic affections.

It would be an easy matter to extend the subject into further fields of clinical medicine, but the danger in these studies has always been to go too far, so that a reaction follows and the possibilities of vasomotor ataxia lie fallow in the minds of clinicians. It may be stated that Herz and other recent writers are very conservative in their statements, and do not invoke essential angiodilation or angiospasm to explain diseased states unless there is not only positive evidence therefor but failure of other causal moments to explain the phenomena.

Before closing, it should be said that the phenomena of angiospasm necessarily simulate closely those due to organic disease of larger arterial twigs—so closely that differentiation is quite impossible at times. Typical Raynaud's disease may be due to actual endarteritis, and the simulation of organic angina pectoris and intermittent limp by functional affections will occur to all.

#### SCLERODERMA.

#### INTRODUCTION.

This affection has been made the subject of several large monographs and many hundreds of papers, and our knowledge of it is still undergoing active evolution. Nominally it has been regarded as a dermatosis, but it is known to attack practically every tissue in the body. Strictly speaking, it cannot be regarded as essentially vasomotor or typhoneurotic in character, nor can it be made to depend essentially on anomalies of the ductless glands, although all three of these factors may be involved, and the condition presents transition forms with affections which do possess such characteristics. Thus it possesses analogies with myxedema and acromegaly, both in the localization and in the hyperplastic element which is its most characteristic feature. Again its favorite localization in the digits tends to place it in part among the acronoses, in which both vasomotor and trophic elements coexist. In its more generalized forms there are notable trophic alterations in the appendages of the skin and even at times in the teeth. But all of the symptoms may be explained by the hypothesis that whatever the cause and nature of the disease it is at the outset limited to the terminal arterioles. This being conceded it becomes apparent that the chief causal moment ought to proceed from some part of the nervous system, rather than from any peculiar quantity of the circulating blood. If there is any central cause able to so act upon the nervous system as to modify both its vasodilator and trophic functions, it should set up a syndrome something akin to what we call scleroderma. Hence we find that the great majority of writers incline to regard the affection as an angiotrophoneurosis. As to what intent the comparatively recent hormone theory of many so-called trophic alterations may modify this view cannot at present be told. That which we not long ago laboriously explained by trophic influences operating through the nerves is now much



more naturally accounted for by increased, diminished or altered hormone production, which involves no nervous mechanism except as the latter may be able to disturb the circulation and nutrition of the hormone producing organs. This would be likely to happen in any universal affection able to cause vasomotor disturbance. Hence if scleroderma is a universal affection, there might come about disturbed hormone production in the thyroid or pituitary glands, or that the symptoms might in some way resemble those of myxedema, acromegaly, etc., which are affections of purely local origin. Similarly it is conceivable that the genital glands might be secondarily involved and give rise to additional symptoms.

A remarkable feature of scleroderma is its occurrence in separate localized forms which appear to be quite distinct from the more diffuse forms of the disease, and are by some authors regarded as varieties, if not distinct types of disease. The occurrence of isolated plaques of disease in sound areas of skin, is termed by the dermatologists morphea. While it is now regarded as localized scleroderma, it is difficult to explain its origin as part of a general disease. Local irritation, either direct mechanical or indirect neurotic, seems necessary to account for these circumscribed, localized lesions. The isolated localization in the fingers, known as sclerodactyl, is of great interest to the neurologist because transitions readily occur between this and other forms of acroneuroses, such as have already been alluded to. Since scleroderma may attack the vulva and vagina, the opinion has been advanced that the mysterious affection known as kraurosis vulvæ is a localized scleroderma. Histological studies appear to show that such a supposition is quite groundless. Finally, the affection known as sclerema neonatorum is regarded as having no connection with scleroderma, although the latter may set in so early in life that confusion results. There is also some confusion between idiopathic hemiatrophy of the face and local scleroderma in that area.

#### ETIOLOGY.

Scleroderma may occur at any age whatever, but appears to be a disease of mature years rather than of either extreme of life. Aside from the condition known as cleremia neonatorum with which it has no connection, it is possible that it may occur in the fetus and be present at birth. Sex has a decided influence,



for while in some statistics the sexes seem equally involved, in others there is a notable preponderance of females. The relative frequency of the affection is not readily determined. There is one case of scleroderma to every two or three thousand cases of skin disease, while in clinics for nervous affections the proportion seems higher (about one in one thousand).

Scleroderma is a familial affection to a very slight extent only, and attempts to show that it has a tendency to occur in neuropathic stock have not been altogether successful. More migraine is found in ascendants and collaterals than could be explained by mere coincidence. It is possible that a properly conducted research would bring out evidence of a tendency to vasomotor ability. The fact that the affection has frequently followed an infectious disease means no more than that a general lowering of resistance may have resulted, and this should also be true of scleroderma following syphilis, tuberculosis and other dyscrasic states. An exception must, however, be made of rheumatism. In a certain number of cases the close association of the two processes is unmistakable. Furthermore, the disease may appear to develop as a sort of rheumatic equivalent, *i.e.*, under conditions of exposure, etc., such as commonly cause rheumatism.

The fact that certain cases have supervened after physical trauma is probably best explained by psychic effect. If to these cases are added those due to emotional influence, and those which develop without apparent cause in neuropathic degenerative stock, and which may be associated with functional neuroses, a considerable material results. On the other hand, the absence of coincidence between scleroderma and organic nervous affections seems opposed to the doctrine of necessary neuropathic substratum. But it cannot be shown that the other acroneuroses and angiotrophoneuroses in general have any greater etiologic claim to be so classed. As will be seen, scleroderma is clinically a member of these families, and further, not infrequently associated with some one of them. All show some common tendency to vasomotor lability, neuropathy, and a rheumatic component.

#### SYMPTOMATOLOGY.

##### I. GENERAL.

The symptoms of scleroderma may be considered from several viewpoints. Let us first study the phenomena common to the

disease in any locality. The first change manifested in the integument (or mucous surface, etc.) is an edema which is firm to the touch. The lesion resembles an ordinary edema, but does not pit on pressure. The edematous stage may escape observation, and perhaps may not always be present. It may show a decided volatile or fugacious quality, disappearing and reappearing. Conversely it may be so intense as to result in, gangrene. The area involved may be of any extent. Clearly an angiospasm of very variable extent and intensity must be involved.

To this edematous stage the indurated or hide bound stage succeeds. The skin begins to feel drawn and upon examining it the patient notes a peculiar hardness and smoothness. The folds of the skin disappear. Not only the size and shape of the indurated area but also its color exhibit endless variation, which gives rise to a number of local designations. A face thus affected becomes mask-like, the trunk is as if it wore a cuirass, etc., while according to the firmness, thickness and color and feel of the skin it may be likened to parchment, leather, ivory, marble, the cadaveric skin, etc. The indurated stage is followed by one of atrophy, in which not only does the thickened derma become progressively thinner, but the various individual structures which make up the skin and its appendages exhibit trophic alterations. This general condition of atrophoderma now exhibits some of the features common to atrophy of the skin from other causes, so that more or less confusion may result. The skin remains hide bound but is on a lower level than the surrounding sound integument.

From a second viewpoint, scleroderma may be acute or chronic, and naturally a highly acute and at the same time diffuse case would present hardly any clinical resemblance to an eminently chronic, narrowly circumscribed process. It may also begin as a widely disseminated affection, and the individual lesions may be large and diffuse or very small. The original induration may quickly pass to atrophy, so that when a patient is first seen professionally a depressed scar-like area is in evidence. The remarkable play of colors sometimes seen is due to various factors involving the blood-vessels and pigment. It appears from isolated cases that minimal cases occur in which there is neither edema, induration or atrophy, but merely anomalies of the blood-vessels and pigment. In the fingers of high degree of vascular disturbance occurs as shown at times by persistent cyanosis, and less fre-

quently this is noted in other localities. A transition to Raynaud's disease is naturally suggested by such cases. As a matter of fact an initial cyanosis of the fingers may persist for an indefinite period, to assume eventually the form of Raynaud's disease, sclerodactyl or a mixed type. Similar confusion may exist between sclerodactyl and erythromelalgia. Back of all these conditions, and at times going no further is a state of vasomotor lability shown by sensitiveness to cold, unnatural coldness, active hyperemia, paresthetic sensations, etc., which furnishes a strong local predisposition to the acroneuroses in general. In extreme cases the amount of edema and redness preceding scleroderma of the extremities has masqueraded as erysipelas.

From the viewpoint of strict localization the symptoms of scleroderma are naturally numerous, varying greatly with the site. We may here note the isolated circumscribed patches which occur in the continuity of the skin of the limbs, head and face, and trunk, and were long regarded as a distinct idiopathic affection under the name morphea. A study of these lesions naturally shows wide departures from the acroneuroses, for there is no family group of morphea-like affections. Telangiectases, anomalies of pigmentation and atrophic scar-like depressions are in evidence, and this peculiar association is responsible for the former belief that morphea was a form of ancient leprosy which robbed of all danger persisted to the present day. Maculo-anesthetic leprosy was known to begin with multicolored patches of eruption which eventually became atrophic. As a matter of fact, however, morphea is not associated with sensory disturbances.

In the indurated stage of scleroderma there is no necessary involvement of the sebaceous and sudoriparous glands, but once the stage of atrophy is reached, there is falling of the hair in the affected area—naturally very conspicuous when the scalp or bearded face is involved—and secondary destruction of the cutaneous glands. The atrophy of the hair follicles and nails which is seen often in scleroderma is, however, not due essentially to lesions seated in the integument but to more deeply seated causes. This is shown by the fact that in a very small percentage of cases these trophic affections of the appendages precede the appearance of sclerodermatous plaques. The rare instances in which the teeth have been shed may perhaps be due to scleroderma of the gums.

The induration of the skin necessarily interferes with the



functions of the subjacent muscles when these are superficially placed, as in the case of the muscles of facial expression, and when the joints are partially immobilized. Since some of the facial muscles are concerned with the acts of eating and speaking, these functions may be more or less compromised. In extreme instances of this character it is probable that the mucous membranes and subjacent muscles are directly attacked by the disease. In high degrees of scleroderma the muscles beneath may undergo one of two changes or both may be conjoined. These are respectively atrophy from inactivity and actual sclerosis with sequential atrophy from direct involvement. The latter will be discussed presently. It is said that atrophy of the muscles from whatever cause is more apt to be encountered in elderly subjects, where there is a native tendency to retrograde changes. Special cases are occasionally reported in which some of the larger muscles or an entire group of muscles—the calf of the leg for instance—are the seat of a notable degree of atrophy. As the superjacent skin may be normal it is evident that we must not be too hasty in referring muscular participation to the primary skin lesions. In sclerodactyl there is necessarily a notable interference with tendon action. The association in rare instances of scleroderma with ordinary progressive muscular atrophy is probably accidental.

It has been known for many years that the same combination of factors which is responsible for scleroderma proper obtains in a restricted degree for practically all the tissues of the body. For this reason the term scleroderma is a misnomer. As was noted in speaking of the muscle changes, some of the lesions are primary, others secondary to changes in the integument. The tissues which are attacked directly by the disease include the bones, muscles, joints, fasciæ and ligaments. It has already been stated that the mucous membranes are often independently attacked. Hence the disease is very largely restricted to the skin and subcutaneous tissues, mucosæ and submucous tissues and locomotor apparatus. To what extent the viscera, blood and nervous system may be involved is at present conjectural, for scleroderma as a generalized affection is extremely rare and certain visceral lesions associated with the more commonly encountered alterations might be due to mere coincidence.

It is hardly worth while to discriminate sharply between primary and secondary affections of the osseous system in scleroderma. That the nutrition of the bones may be notably



modified is shown by the fact that hypertrophic as well as atrophic changes have been observed. The presence of hypertrophies under such circumstances suggests the possibility that the primary process has attacked some of the glands of internal secretion which preside over growth.

The osseous changes show great irregularity in their site and evolution. The most common numerically are the changes in the phalanges of the fingers which accompany sclerodactyl. It is of course impossible to state whether the bones have been attacked at the outset or whether an extension of the skin lesions has occurred, or finally whether the more superficial lesions have merely interfered with the nutrition of the bones. We know that the bones do not necessarily participate in sclerodactyl. A slight arrest of development noted sometimes in the bones of the arms shows plainly that the osseous structures may be directly attacked by the morbid process. A singular tendency to arrested development of all the skeletal structures of one-half of the body, occurring as part of a disease called symmetrical, suggests that the bone lesions may be secondary to participation of a hormone producing gland. In so-called hemiatrophic facialis this one-sided bone atrophy is in evidence, but a corresponding unilateral hypertrophy has also been seen in scleroderma. All these changes certainly bring scleroderma in touch with acromegaly, myxedema and cretinism and pancreatic infantilism. Some tendency to hyperostosis is rarely seen in the long bones. Naturally, with this disposition to attack the bones, the joints can hardly fail to participate at times. In the alleged frequent presence of chronic articular rheumatism in sclerodermatous subjects, it is possible that the joint lesions are in part due to direct participation in the primary disease. There is also a sort of transition between the state of the joints in scleroderma and arthritis deformans. When we bear in mind that the latter affection has been brought in close relationship with a pathologic state of the thyroid, we can understand the possibly important rôle played by the ductless glands in all trophic diseases. The vertebral column may doubtless be involved in scleroderma, but to what extent and degree is unknown.

Not much is known of scleroderma of mucous surfaces save that we know that the whole of the buccal cavity and tongue may be involved and that the larynx has seemed to be specially attacked in a few cases. In recent years it has been discovered

that the female genitals may participate, a condition grossly resembling but essentially unlike kraurosis vulvæ resulting. Quite recently it has been learned that the bladder and kidney pelvis may be involved.

In theory we should expect to find blood changes, anomalies of metabolism, fever and such evidences of a general disturbance. But aside from those which are plainly secondary to some of the serious local changes set up, or which might be conceived as due to the implication of some of the glands of internal secretion, it can hardly be claimed that any general disturbances occur. It is said that thyroid symptoms are quite often present. Crippling of the chest by large constricting bands favors the development of tuberculosis. Difficulty in taking food may be marked enough to affect the nutrition. The significance of digestive disturbances of all kinds, such as often occur in scleroderma, is by no means apparent. Owing to the age at which scleroderma is most common an association with arteriosclerosis, nephritis, heart disease, etc. is occasionally encountered.

## II. SPECIAL, LOCAL SYMPTOMS (NOT INCLUDING SCLERODACTYL).

In an affection like scleroderma which clinically appears to be made up of several distinct conditions, no general description will suffice, although the special symptomatology will necessarily be largely a recapitulation of much that has already been said.

There is a generalized form, there are diffuse forms, and circumscribed forms. There is a special acro-form which places scleroderma among the acronoses under the name sclerodactyl. There is a scleroderma in plaques known as morphea, and a scleroderma in constricting bands. The latter is said to owe its peculiarities to involvement of the subcutaneous tissues, while morphea seems to stand in some relationship with dermatoses which depend on injury to that nerve trunk which supplies the affected area—that is, it has features in common with nerve leprosy and herpes zoster. In regard to the course of the disease we see acute and subacute forms in which edema is a feature and at the other extreme chronic progressive forms which tend to involve the more deeply seated tissues.

Generalized or universal scleroderma and the more marked forms of diffuse scleroderma may be grouped together, although doubtless representing distinct types. Naturally the chronic progressive type which is able to attack nearly all of the tissues belongs in the same class. In the very highest degree of this

general type the subject becomes a human freak, a living mummy, a dwarf. No sharp line can be drawn between universal and diffuse forms for even in the worst examples there may be small areas of sound skin. The universal and highly diffuse cases make up about one-sixth of the entire recorded material.

Ordinary diffuse forms which are characterized by lesions in various parts of the surface attack the limbs, head and face and trunk in the following order of frequency: upper extremities, trunk, head and face and lower extremities. The fact that the upper extremities are so much more commonly involved is due evidently to the fact that the fingers are especially predisposed to attack. Although cases occur in which only one side of the body is affected they are infrequent and this localization is not significant of anything any more than the fact that some patients are attacked only above or below the waist line. There is no special tendency for the disease to attack either the thickened or thinner portions of the skin. Irritation from without does not act as a contributory factor, for localities like the palms and soles even seem more exempt than most areas.

While unilateral location has no fundamental significance it is natural that the first lesions in a diffuse case should often appear on one side, where if the progress of the disease is very slow they may remain so long alone as to suggest a unilateral localization. As a rule the other side follows the first in time. On the other hand true symmetry is equally rare, aside from sclerodactyl.

The plaques and bands of diffuse scleroderma do not differ in any way from the isolated or solitary lesions known as morphea. As already mentioned, their localization seems at times as if it depended on the nerve distribution. This is seen to best advantage on the head and face, where a neurogenic atrophy or alopecia areata may be mimicked. The condition known as hemiatrophia facialis also has a sclerodermatous analogue due to the fact that in both processes there is evidently the same trophic component. All the soft parts and bones may be involved, and instead of atrophy hypertrophy is sometimes in evidence. It is certain that this condition may exist without a sclerodermatous component and likewise apparently certain that the two processes are kindred trophic affections.

Much has been written concerning the agreement of the plaques and bands on the trunk and limbs with spinal metameres and the agreement in some cases is in striking contrast with the planless irregularity which is most commonly in evidence.



But no evidence has been secured to bring the disease in any close connection with nervous or vascular areas. It is known that exceptionally any diffuse dermatosis may be grouped in an arrangement suggesting special metameres. This is seen rarely in eczema, psoriasis, etc.

### III. SCLERODACTYL.

The localization of scleroderma in the fingers possesses the greatest interest for the neurologist because of its relationship to the vasomotor and trophic neuroses. By contrast the localizations on the skin of the trunk and limbs, despite their occasional distribution in nerve areas present the neurotic element in so slight a degree that such lesions probably most commonly find their way to the dermatologist or surgeon. As a rule sclerodactyl is associated with sclerodermatous lesions elsewhere, but about one case in three is isolated in the fingers. Conversely we sometimes encounter widely diffused scleroderma in which the hands are spared. It is a somewhat singular fact that an affection which possesses such a marked tendency to affect the fingers is so little disposed to attack the toes. The latter are but seldom involved and then but slightly. To render this immunity more singular, the lower extremities aside from the toes are frequently the seat of sclerodermatous patches. In marked cases of generalized scleroderma the toes often show evidences of vasomotor disturbance but actual sclerodactyl in the toes is extremely rare. It is therefore in its complete evolution almost peculiar to the fingers.

Sclerodactyl is most commonly a symmetrical affection, agreeing in this respect with the other acroneuroses. The clinical picture must differ much with the degree of vasomotor disturbance in the skin, the participation of the subcutaneous tissues, the alterations in the bones and joints, the relative preponderance of hypertrophic and atrophic changes the former of which involve both soft parts and bones, the amount and character of the deformity, etc., etc. Among so much confusion we may isolate certain clinical types which through their resemblance to other acroneuroses tend to cause errors in diagnosis. Any one of the three vasomotor states in active hyperemia, cyanosis and anemia, may be present in a given case, either as a transient initial stage, or as a sort of abortive type. If there are no evidences of scleroderma elsewhere a diagnosis



would hardly be possible. The vasomotor symptoms may appear as serial attacks, and an initial syncope may be followed by hyperemia or cyanosis. On the other hand, sclerodactyl may develop without any vasomotor component. When the latter is present to a certain degree it is useless to regard it as simulating Raynaud's disease, for the latter is actually present, as shown by the fact that in rare instances the condition leads eventually to symmetrical gangrene, which occurs side by side with sclerodactylous changes. It is probable that the more the Raynaud's disease element, or vasomotor component is present the greater is the tendency for the sclerodactyl to be sharply localized, and for the subsequent sclerodactylous changes to remain limited closely to the area of vasomotor disturbance.

While in a certain number of cases of apparent Raynaud's disease of whatever degree the majority will never show any sclerodactylous element, and a small minority may show both aspects of terminal mischief, *i.e.*, acute trophic change (gangrene) and chronic trophic alterations (dystrophy) there is a third type in which the picture of incipient Raynaud's disease is succeeded wholly by sclerodactyl, and a fourth in which no vasomotor stage or component is ever present at any time. Finally there is a still more paradoxical form, *viz.*: that which at first belongs to the preceding type, but in which after the development of the dystrophy a vasomotor element first comes in evidence. It must be borne in mind that while the vasomotor feature tends to appear in successive attacks, nothing of the character is seen in the dystrophy which is progressive throughout, although it varies much in the degree of severity. When no vasomotor element is present the skin undergoes certain changes as part of scleroderma which might at first sight be ranked under the syncope and anemia of Raynaud's disease. Thus in any case the fingers should be somewhat swollen and cold, but harder than in Raynaud's disease and devoid of any pains or anomalies of sensation.

We should now discuss the chronic dystrophic component, which is lacking throughout in pure cases of Raynaud's disease. This may be but slightly in evidence or may be so pronounced as to suggest the worst cases of nerve leprosy. We may follow the example of Cassirer and discuss these changes under the pathologic anatomy, and also under the natural evolution of the malady wherein the clinical side will receive due attention.

## DIAGNOSIS.

The individual varieties of scleroderma each require differentiation from other localized forms of disease. Sclerodactyl may be brought in comparison with nearly all of the acroneuroses, including acroparesthesia, erythromelalgia, Raynaud's disease; also acromegaly, Morvan's disease, leprosy, and glossy skin. That is, at some stage of its evolution or in some special case, it may simulate one of the preceding affections; since it may actually exist in combination with one of the acroneuroses, differentiation may be impossible. Even an association with Morvan's disease seems possible in some cases of sclerodactyl with anesthesia and painless felons; for as a rule there are no sensory disturbances in scleroderma. Again an association with glossy skin seems possible, as if the peripheral filaments in a spinal nerve area had been injured by the disease. The hypertrophy of the phalanges in sclerodactyl may be so marked that acromegaly is suggested. Generally speaking, whenever diagnosis is difficult or impossible it is best to conclude that a mixed type of disease is present. There is hardly any likelihood of a transition form between leprosy and scleroderma as far as sclerodactyl is concerned and when the latter simulates *lepra mutilans* there should be no difficulty in distinguishing between them. Leprosy is always anesthetic, while sclerodactyl in the great majority of cases is not. This same token should differentiate spots of morphea so called from areas of maculoanesthetic leprosy.

The peculiar condition known as hemiatrophia facialis, which, however, should merit another name, since hemihypertrophy may be the lesion, is best considered separately. It is enough to state here that some cases of it cannot be distinguished from scleroderma. If hemiatrophy were bilateral and always associated with sclerodactyl, the combined lesions would constitute an anomaly of the same type as acromegaly. Areas of atrophy of the skin occur in the face or scalp and behave like any other spots of morphea. There seems to be no way by which these small areas can be distinguished radically from those which involve all the skin, cellular tissue, etc., of one-half of the face.

In certain cases of scleroderma the disturbance of pigmentation may be extensive and in a few cases it has been surmised that there was an association of scleroderma with Addison's disease, such as might be due to the invasion by the general sclerodermatous process of the adrenals or solar plexus.

When the edema is very pronounced there may be suspicion of the existence of some one of several affections—myxedema, edema from lymphatasis (erysipelas, elephantiasis). Since certain forms of edema occur in chronic rheumatism while arthropathies sometimes accompany scleroderma it is necessary to distinguish between the two, and in certain cases once before alluded to this is not always possible. In other words transition forms may occur temporarily.

It is evident that small spots of scleroderma may at times closely resemble other forms of secondary atrophoderma—such, for example, as occur in lupus erythematosus, canceroid, etc.

#### PROGNOSIS.

The prognosis of a disease like scleroderma must depend largely upon the course and stage. Certain authorities describe prodromes which show the existence of a constitutional disturbance or a disorder in the nerve centers. However, aside from sclerodactyl it is hardly worth while to mention prodromes, for these are not only infrequent but do not appear to follow any particular type. In the fingers we may see the vasomotor disturbances already mentioned (syncope, asphyxia, coldness) which may persist for a long period and may be associated with paresthesiæ, or the latter may occur alone.

There is an acute type of the disease, characterized by indurative edema. It is rare and appears to occur by preference in young children. It may last for weeks, at times for months. The area involved is usually considerable and may be universal. The acute form may be self-limited, although the affected parts may not show complete recovery; or it may pass into the ordinary chronic type. In certain cases of the chronic type there may be acute exacerbations; or the disease may consist for a long time of a series of exacerbations. While cases of the acute type are rare, acute manifestations of the disease are rather common. In other words, a large proportion of chronic cases have at some time or another shown acute symptoms. When the disease is chronic and progressive—until atrophy is complete—it is very difficult to estimate the rate of growth or to foretell what may develop. The rate may increase or diminish.

About the only criterion for prognosis is the response to treatment, but the outlook in sclerodactyl is poor throughout. In the acute manifestations the prognosis may be good for the



time, but even if the condition improves another exacerbation may occur. The prognosis in children is better than in adults because they may in part outgrow the affection.

The main tendency is for the affection to progress until the tissues are completely atrophied. As a rule the vital organs are not compromised although in certain cases involving the thorax respiration may be crippled seriously, and in cases in which the facial muscles are involved there may be difficulty in taking food. These disabilities favor malnutrition and tuberculosis.

#### PATHOLOGY.

If scleroderma is actually a general disease there should be pathologic alterations in the various tissues which tend to show the presence of a single process common to the latter. Naturally the minute alterations which give rise to the gross symptoms may not be the earliest changes to occur, but may be secondary to changes in more remote localities—for example, the central nervous system or ductless glands.

The first changes to be mentioned are those which occur in the skin and subcutaneous tissues. The tissues which form the epidermis are not essentially altered, but may show alterations in individual cases. This is true especially of the pigment layers for anomalies of skin coloration frequently occur and show great diversity. The essential changes occur in the corium, but authorities are not agreed as to their nature. The weight of evidence is against the existence of an extensive hyperplasia of the corium. That is, the atrophy which develops later is not preceded by any adequate condition of hypertrophy or inflammatory hyperlastic change. A process problematic in nature evidently in the corium and extends to the subcutaneous connective tissue. This process seems to stand in a necessary relationship to the blood-vessels, therein resembling an inflammation, and there is further some perivascular accumulation of cells. In scleroderma, however, the changes do not merely begin about the vessels, but the latter are actually involved in them. It is highly probable that the disease begins in the walls of the vessels, so that proliferation occurs both in and around the latter. The great variety in size, shape, distribution, etc., in sclerodermatous areas would then depend solely on the distribution of the affected vessels. The first question to suggest



itself is in reference to a possible relationship between scleroderma and arteriosclerosis; for if large blood-vessels are involved in the former, some confusion might result. As a matter of fact in scleroderma we do not find more participation of the larger vessels than could be accounted for by coincidence.

We know very little about the anatomical changes in the other tissues, for in the muscles which have been studied in this connection the changes seem to have been due purely to secondary extension from the subcutaneous tissue. No doubt the extension is affected through the blood-vessels, so that it would be practically impossible to state whether the muscle localization were primary or secondary. The muscle changes appear to resemble closely those of interstitial myositis. But few histologic studies of bone have been made, and the inference is that the nutrient vessels may first suffer, as a result of which the compact bone tissue undergoes some rarefaction and solution. In other cases the periosteum seems to undergo sclerotic changes like those of the skin, which presumably interfered much with the nutrition of the subjacent bones.

In parenchymatous organs the changes begin naturally in the blood-vessels of the interstitial connective tissue. Studied in these viscera the resemblance to ordinary inflammation seems more pronounced than in the skin. It will be remembered that these organs are naturally disposed to chronic productive inflammatory processes which end in atrophy and destruction of the parenchyma; and that not much is really known as to the nature of these processes. Now the skin is not predisposed to any corresponding process. If it were, such a process would naturally bear some clinical resemblance to scleroderma. In the visceral affections of the latter there are notable changes in the blood-vessels, and the secondary involvement of the interstitial tissue is not so pronounced as to cause any notable macroscopic alterations. If there were changes in the nervous centers or ductless glands a question would arise forthwith as to the possibility that such lesions might be viewed as initial in point of evolution, since disease of these structures is known to be responsible for trophic disturbances in various structures. On the other hand, in any universal process the organs in question would be secondarily involved, and again might set up further trophic disturbance. It is readily intelligible that even slight changes in such structures as the medullary centers, various nuclei of origin of cranial nerves, the cells of the anterior horns

of the cord, the sympathetic ganglia, the hypophysis, the parathyroids, etc., could determine marked alterations at a distance. But at present we can only state that the anatomic evidence along this line is too scanty and equivocal for sound conclusions.

To return to the underlying vascular alterations; the arterioles, venules, and capillaries all seem to be alike involved, and the lymphatics are commonly held to participate. All three tunics of the vessels are the seat of a process often termed straightway arteritis. The tissue elements of the arterial wall are numerically increased, so that a true hypertrophy results. The endothelia, the muscle elements and the connective tissue all show proliferation. In some cases this appears to be restricted to certain coats only. To the hypertrophy of the blood-vessels succeeds atrophy.

If it could be proven that these vascular changes constituted the disease, proper, that the hyperplasia extended to the surrounding tissues while a separate series of phenomena were set up as a result of disordered nutrition from vascular disease, scleroderma would be much less mysterious. But some investigators insist that scleroderma may occur not only without any parallelism with arterial disease, but even with intact vessels. We may find marked vascular change associated with mild degrees of scleroderma and *vice versa*.

No adequate explanation exists of the early infiltration and hardening of the skin which precedes the atrophic stage. The amount of actual hypertrophy and hyperplasia seen under the microscope is far from sufficient to explain this phenomenon. It has been assumed that lymph stasis is largely responsible for it but the picture is very different in scleroderma and elephantiasis. Some authors speak of an infiltration with colloid substance of coagulable albuminous exudate.

The pathologic anatomy of sclerodactyl should be considered separately, for both vasomotor and trophic components are readily apparent here; while on the other hand ordinary scleroderma is not typically in evidence. The vasomotor changes have already been discussed. The trophic changes are multi-form, some being hypertrophic while others are atrophic. There is no necessary sequence involved. We may see a hypertrophy of the phalanges, while the superjacent skin is tense and atrophic. Atrophic changes such as have already been mentioned are more commonly seen, and these may be present in high degrees. Implication of tendons and joint capsules add to the deformity

and loss of function. The changes seen in lepra mutilans may be paralleled, save for the absence of a sensory component. Felons may develop from accidental infection in the devitalized tissues. If Raynaud's disease is superadded which as already stated is by no means uncommon, anesthesia and gangrene may develop.

#### PATHOGENY.

This section naturally has reference principally to theories and hypotheses, for little is known of the intimate nature of the disease. There are numerous theories concerning the latter, which have all been touched upon to some extent. Thus there is the thyreogenic theory, the neurogenic theory, the sympathetic or vasomotor theory, the rheumatic theory, and so on through all possible views. At present it is not difficult to disprove each one of these theories as far as they apply to all cases of the disease; and conversely, in individual instances any one of the theories may seem almost self-evident.

For the expression thyreogenic a more general term should be substituted, such as would naturally refer to all the glands of internal secretion. For the relationship which sometimes is evident between scleroderma and acromegaly seems to implicate the hypophysis. Concerning this glandular theory we can only state that it can hardly explain scleroderma as a whole; but if scleroderma is a disease which attacks all vascular tissues a little disturbance in the circulation of one of these bodies might easily add a special hormone syndrome to that already present. The same grafting process can occur in all general diseases in which one of the ductless glands is involved.

The toxic theory is not a very clean cut one since such a term might be used as a synonym for some of the other theories. The term microbic is more satisfactory, the toxins suspected of causing the disease being wholly of bacillary origin. The earliest application of this theory is doubtless seen in the old view which regarded morphea as due to attenuated leprosy. This view is still upheld by some modern leprologists, and not only scleroderma but Raynaud's and Morvan's diseases have been attributed to the leprous virus. One might therefore, from this point of view, use the expression metaleprous. Scleroderma, like Raynaud's disease, may also in some cases suggest a metasyphilitic affection, through the community of blood-vessel lesions. We



may undoubtedly have pseudo Raynaud undistinguishable from the genuine as a result of syphilitic arteritis, and Raynaud's disease seems to pass insensibly into scleroderma; but aside from this there seems to be no possibility of a syphilitic element in the latter. Tuberculosis may also be excluded as a possible component. The claim that scleroderma may be due to a specific germ and its toxin is by no means fanciful, but no evidence has thus far been adduced.

The fact that the key to our knowledge of scleroderma has appeared to lie in the primitive vascular implication hardly enables us to set up a vascular theory, for the lesions of the blood-vessels might be referred either to blood states or nervous influence. The blood or toxic theory has already been mentioned and the vasomotor theory will be discussed later.

At various times scleroderma has been brought in relation with diathesis, as arthritism, rheumatism, etc. This diathesis, by whatever term we may call it, is sufficiently common, and it is possible that those affected by it are more disposed than others to develop the disease.

A neurogenic theory in the narrower sense implicates the central nervous system, especially the spinal cord. The occasional grouping of the lesions in spinal metameres, the analogies with syringomyelia, the dystrophies, seem to point to a spinal element. No one has found any lesions in the central nervous system capable of explaining scleroderma, and the latter, as already stated, is said to be notably absent in all organic diseases of the nerve centers. The peripheral nerves can be excluded, so that only the sympathetic remains; thus because of its relationship with the vascular system, and because of the manifest vasomotor component of sclerodactyl, gives us the best working hypothesis of scleroderma, which is conceived as an angioneurosis with a trophic component—an angiotrophoneurosis. If the only clinical expression of the disease were sclerodactyl, this pathogenesis would be sufficient.

This leads us to state that at present scleroderma is best considered as a multiform affection from which certain types may be isolated. These types depend a good deal on the localization but the differences are much greater than the site can account for. Thus sclerodactyl is a vasomotor neurosis, while scleroderma on the trunk, distal parts of the limbs, face, etc., may present a spinal type. If there is marked implication of the bones of the fingers, facial bones, etc., an acromegalic type



is suggested. In like manner a majority of all cases probably fall under special types.

#### TREATMENT.

There is not a single resource upon which we can surely depend to influence favorably any of the stages of manifestations of scleroderma. The fact that certain lesions disappear while others are in process of evolution, and also during pregnancy and under various unknown conditions, has doubtless been responsible for alleged amelioration under different therapeutic procedures. In theory scleroderma implies a drying-out process, since the skin and subcutaneous tissues lose their original water of composition; and as a matter of fact the disease has been seen to progress with undue rapidity when there has been a loss of fluids, as in severe diarrheas, pernicious vomiting, etc. In theory, therefore, retention of water should be favored.

Until comparatively recent years the main resources for treatment comprised electricity in various forms with massage and hydrotherapy. Electricity has been used in all possible forms, galvanism being perhaps the most commonly used. The results are by no means always favorable, and in some cases distinctly the reverse. The inunctions which are incidental to massage should receive some of the credit for any good results which may follow its use. Among hydiatric procedures those which most rouse the activity of the skin should give the best results, such as warm vapor baths. Strapping the limbs with medicated plasters is a useful accessory to massage, which may also be effected when a dressing of this sort is in place. The kind of plaster usually preferred is the salicylic. Active motion should be used when practicable, passive motion otherwise. This resource, along with massage and electricity is probably well worth employing to maintain the integrity of the muscles.

In more recent years radiography and radium have been used with occasional apparent benefit.

*Theosinanian* or febrolysin is now used as a routine procedure for most cases. The large number of complete failures recorded, and the tediousness of the treatment, constitute serious drawbacks to its use.

Thyroid preparations, adrenalin and hypophysis extract are all used more or less and positive results are occasionally reported. Although thyroid extract has been given over long periods of

time it is not known that any serious collateral effects have been induced.

On account of the arthropathic element so commonly present the salicylates have been used largely. As is the case with the competitive procedures a few brilliant and numerous doubtful results must be offset with any number of flat failures.

The supposed syphilitic element in certain cases does not certainly respond to specific treatment.

The probability is that a patient will do better under a combination of all plans of treatment than adhering to any one plan, however promising. Especially should all the physical measures be conjoined, together with general attention to nutrition and hygiene. Tonics like iron, quinine and arsenic are rationally indicated. Ergot is sometimes used on theoretic grounds to modify the condition of the blood-vessels. Iodine in some organic combination has been used because of the occurrence of this substance in thyroid extract.

#### MULTIPLE NEUROTIC GANGRENE OF THE SKIN.

##### INTRODUCTION.

This affection as repeatedly described occurs *d'emblee*, without the least evidence of traumatism, local inflammatory arterial or organic nervous disease or cachexia. As such a condition is almost inconceivable it is inevitable that the disease so-called has been looked upon as a matter of artefacts made with intent to deceive, mystify, or gain sympathy or reimbursement for alleged injuries, or release from some obligation. Nor is a motive always apparent. Only recently a case was reported in which a man in comfortable circumstances was admitted on different occasions for what proved to be self-inflicted sulphuric acid burns which simulated multiple gangrene. After simulation had been confessed the confession was again withdrawn. As there was in such a case nothing to gain and much to lose, the patient, apparently sane, was nevertheless regarded as alienated simply through the evidence of this one penchant. In certain cases the hysterical or degenerative character of the subject, the site and character of the lesions and the environment are such that no doubt of the self-inflicted nature of the lesions could be held; this view is usually corroborated by properly controlling the case.

If it can be shown beyond doubt that one genuine case has

occurred, many others under suspicion would doubtless be regarded as genuine. It would be possible that after a genuine spontaneous episode had occurred—the motive for simulation being already present—an attempt at reproduction would at once be suggested and eventually carried out. Indeed, without some basis of fact it is difficult to understand how a patient would come to simulate a disease the very existence of which is denied. On the other hand, if there is any suspicion of some definite causal element other than simple neurotic or angioneurotic influence the case would not properly belong under this head. It must be borne in mind that in rare instances certain simple lesions of the skin may become gangrenous. Chicken-pox is one. These possibilities will be discussed under diagnosis. If all accessory moments are excluded the so-called spontaneous neurotic gangrene becomes of the same type as any psychogenous affection and in fact is practically one with hysterical gangrene which name is freely applied to it. In any hysterical lesion the question must arise as to simulation or suggestion. The possibilities of the latter appear to have no limits. It is conceivable that a persistent spasm of the peripheral vessels could lead to a gangrenous focus. From another viewpoint it is possible that a neurotic gangrene may be purely neurogenous and dependent in some way on actual disease of some of the central nervous structures.

#### ETIOLOGY.

The age and sex follow those of hysterical affections in general, although the material suitable for analysis is rather limited. Most of the patients have been young women. It is, of course, understood that cases of undoubted simulation are not reckoned. While, as already stated, actual traumatic gangrene and gangrene secondary to suppuration are excluded from consideration, a history of some antecedent traumatism is common. The relationship of these wounds to the subsequent gangrene is very obscure. One may readily imagine that during cicatrization a focus of nervous irritation develops which may set up trophic disturbances *in loco*. This, however, only explains the initial lesion. The next lesions to develop occur as a rule in the original area but eventually they may appear anywhere. After several lesions have appeared both suggestion and simulation are favored. The interval between the traumatism and the first gangrenous lesion may be so prolonged that any such subject as scar irri-



tation would seem out of consideration, and in a minority of cases there has been actually no history of a trauma *in loco* or anywhere else. In the great majority of cases the gangrene does not develop at the exact site of the wound.

Since in theory these cases should occur by preference in highly hysterical subjects or in those with extreme vasomotor lability or both conjoined, a study of the constitution of the patients is of extreme importance. Contrary to what one would expect, but very few patients have shown any form of major hysteria. The most that can be said under this head is that the great majority of subjects are distinctly neuropathic. Data as to an angiospastic constitution are not forthcoming. On the other hand, in a few cases there is some evidence of past or present organic disease, especially spinal gliosis, peripheral neuritis and zoster. This factor seems as commonly in evidence as frank hysteria, excluding, of course, detected cases of simulation.

#### DIAGNOSIS AND TREATMENT.

The chief point of uncertainty has reference to the possibility of artefacts, for it is, of course, unknown to what extent and variety gangrenous lesions can be artificially produced. If any given caustic, as sulphuric acid, be used for this purpose, the eschars produced would show uniformity in most respects. Next to the selection of the morbid agent, the search for a possible motive for simulation is of importance. Only a very wide experience with repressed personalities can enable a diagnostician to fathom all the possible motives for simulating disease. For example, in the case originally cited of a well-to-do man was suspected of producing acid burns upon himself which led only to a purposeless hospital sojourn, no common motive for simulation could be detected, but such must have been present and to term the patient insane involved a mere equivocation.

As a matter of fact, caustic soda is known to have been used on numerous occasions to produce these lesions. In such cases a violent dermatitis precedes the gangrene. Generally speaking, absence of all kinds of inflammatory reaction tends to exclude the likelihood of artefacts, but we cannot feel so sure about the converse. Kaposi also claimed that in certain cases gangrene in the lower strata of the skin could be seen through intact epidermis. Should such an association be present artefacts could be readily excluded.



The distribution of the lesions is also very significant, for if they do not occur in the same degree in localities not so easily reached by the fingers, the presumption is that they are artefacts. The latter may practically be excluded whenever enough secretion (from bullæ, etc.) can be collected for chemical tests as to presence of familiar caustic substances. Bacteriologic tests have a similar value, to be mentioned later. The medical control of the patient should cause a cessation of artefact lesions. For the rest, the diagnosis consists in excluding the likelihood of cachexia, pathogenic bacteria in the lesions, arteriosclerosis and any other element which could be held responsible for multiple gangrenous lesions. The gangrenous foci which may develop in acute infectious diseases should be readily excluded.

Of treatment in the present stage of our knowledge, hardly anything can be said, for there seem to be absolutely no indications in genuine cases. The lesions should be dressed antiseptically and an attempt should be made to prevent the scars from becoming keloidal.

#### SYMPTOMATOLOGY.

The neurogenic character of the lesions appears to be shown by prodromes of paresthesia which are noted at the site of the outbreaks. These include actual pain, burning, prickling, etc. They are not confined to the actual spots but may be so diffuse as to comprise an entire limb. The interval between the onset of the sensations and the appearance of actual lesions may vary from a few moments to one or two days. In rare cases there is no history of sensory anomalies.

In a neurogenic condition, especially of vasomotor nerve origin we would further expect to see some angiospastic phenomena, which, in fact, we naturally associate with the sensory disturbances, and which figure so extensively in Raynaud's disease. But aside from the very few cases termed gangrenous urticaria, gangrenous erythema and gangrenous zoster, this element is lacking.

Since gangrenous lesions succeed one another in most cases, abundant opportunity is offered to watch the entire cycle of evolution. Phenomena are thereby in evidence which would ordinarily escape observation, so short is their duration. These, of course, are of a different character from the lesions in gangrenous urticaria. After formication or some other paresthesia has attracted the attention to the spot, a redness, wheal or bleb may

appear and quickly pass into a necrotic area; or the latter may occur *d'emblee*. There is no necessary agreement in size between the primitive hyperemic area and necrosis. The former may be large, with a central wheal to mark the site of the future necrosis. This type of case appears to indicate a possible angiospastic gangrene. However, the same necrosis may occur without any such genesis; and in some cases a red areola appears to develop after the necrosis has formed.

There is a group of cases in which the mechanism of zoster is closely imitated. Upon a reddened area a coop of papules develop and these become vesicles and ultimately form a slough, paralleling so-called herpes zoster gangrenosus. The latter is, of course, strongly characterized by its typical course and localization as well as by the neuralgiform pains, but transition cases occur (hysterical zoster). These are also cases of gangrene in which the herpetiform groups of papules do not exhibit a vesicular stage.

The characteristic lesions are naturally the eschars and these show great variations in size and shape. They range from that of a lentil to a silver dollar. Some of the larger ones may arise by confluence. There is no natural tendency for the lesions in a given case to show agreement. In fact great differences are often seen in color, contour, consistence and texture. A secondary areola is present as a rule. This is analogous to the formation of a line of demarcation and precedes the separation of the slough. There is a complete absence of any phagedenic tendency although in a few instances the process has been quite deep seated.

Cicatrization does not take place under the slough, but when the latter is cast off, a stage of ulceration usually succeeds. Indolent but healthy looking granulating surfaces persist, which as a rule cicatrize very slowly. In a fair percentage of cases keloidal scars form, and considerable significance in one or another direction has been attributed to this peculiarity. One sees evidence of the use of crude caustics in producing artefacts, since acid burns, etc., tend to cause keloid. Others behold here evidence of a trophic component. The affection further shows some tendency to recur in keloidal scars.

#### COURSE, TERMINATION, AND PROGNOSIS.

The evolution of the affection is indicated by the history of a typical case: A nervous, delicate or poorly developed subject,

but one with no suggestion of cachexia, receives some kind of an injury of the most varied character. It may suppurate and heal slowly, with scar formation, but this is not essential. In some cases the lesion may resemble the ordinary reopening of a green scar. In other cases, especially when no scar has formed, the primary lesion appears close to the scar or exceptionally it is merely in the same anatomical area. After a variable interval a second lesion appears near the first and in this manner an entire crop of lesions may involve some member, as a forearm. We therefore see side by side lesions of various ages: eschars, recent ulcers, old ulcers, and scars. If the lesions succeed each other rapidly, we may see eschars showing marked differences in size, color and contour, or there may be remarkable uniformity in their appearance. While there is a tendency for the lesions to be localized in one region, yet the affection may appear later in some remote one. There may also be long periods of quiescence followed by active outbreaks. In some cases there seems to be a distinct periodicity, so that the affection has a circular or cyclic character like various neuroses and psychoneuroses. The sensory and vasomotor components already mentioned need not be detailed further, as far as they represent initial phenomena. In addition may be mentioned the anesthesia which naturally appears in any gangrenous integument. During cicatrization the sensibility returns, evidently from regeneration of nerve filaments and the scars may be hyperesthetic.

The affection never makes such headway as to menace life, health or efficiency. Theoretically it may last indefinitely. It cannot be said to respond much to treatment, and it is not probable that the cases on record have been followed until death. A patient who died of intercurrent tuberculosis, was the only one who ever came to autopsy.

#### NATURE AND PATHOGENY.

This subject has naturally received the bulk of the attention devoted to the disease. Cassirer sums up all the labors in this field up to 1900 as follows: The evidence goes to show that multiple neurotic gangrene is not an affection *sui generis*, but a symptom complex called forth under various conditions. We may therefore speak of types of the affection, each of which bears some resemblance to some other known form of gangrene.

There is a type which somewhat resembles multiple arterio-sclerotic gangrene. As in similar parallelisms we may suspect



the existence of a functional affection of the blood-vessels. In this type it is difficult to eliminate the possibility of the formation of angiospastic substances as a result of so-called auto-intoxication. For example, the active chemical principle which causes tetany has a vasoconstrictor activity.

In another type of case the lesions suggest those of simple hysterical gangrene. In the few recorded cases in which manifest hysteria was present we may think of the lesions as eminently neurogenic.

In a third type, actual organic nervous disease actually coexisted (gliosis spinalis, peripheral neuritis, herpes zoster).

In a fourth type urticaria is sufficiently in evidence to justify us in calling the affection urticaria gangrenosa. A subvariety is perhaps associated with angioneurotic edema which is of course very closely related to urticaria.

Cases which develop in patients with poor nutrition suggest that the same component may be present in both neurotic and cachectic multiple gangrene.

In a certain residue of cases the condition appears solely as an expression of neuropathy, in which we may think of a reflex element, *i.e.*, the irritation of the initial wound or scar producing remote effects by acting on a very labile nervous system.

There is one element which in theory may occur in all these types, to wit, the angiospasm which is believed to underlie all vasomotor neuroses.

84 EAST FIFTY-SIXTH STREET.

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## TRANSACTIONS OF THE WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.

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*Meeting of November 10, 1911.*

*The President, DR. SPRIGG, in the Chair.*

DR. I. S. STONE presented a specimen of

ADENOCARCINOMA OF THE UTERUS AND A CASE OF PAROVARIAN  
CYST.

### CASE I. ADENOCARCINOMA OF THE UTERUS.

L. S., age forty-two years. She had been in hospital in 1895 for operation by Drs. Johnson and Stone for pyosalpingitis. Double salpingoophorectomy was performed which resulted in complete suppression of her menses, and also relieved her of pain



and infection. She was very nervous, but in good general health until about six months ago when she saw a little bloody discharge from her vagina. Later on this discharge increased and the patient lost in weight and grew anemic. Examination revealed a very small uterus, the cervix having atrophied until it could scarcely be felt with the examining finger. A diagnosis of adenocarcinoma was made, and the uterus removed by the abdominal method of Wertheim. Small hard glands were found in the left parametrium. The patient had a very serious amount of shock and is still in a critical condition. The uterus is almost entirely involved by the malignant growth.

#### CASE II. PAROVARIAN CYST.

Mrs. H. Patient is a large vigorous and apparently healthy white woman. During the past year she has had irregular and profuse menstruation which led her to seek the advice of her family physician, who discovered a tumor in her pelvis and advised operation. Owing to the very fat abdominal wall the pelvic organs were most difficult to reach and examine. However, a tumor was found which gave nearly all the symptoms of a fibroid yet proved to be a parovarian cyst with a long pedicle.

#### DISCUSSION.

DR. VAUGHAN, discussing the case of cyst of the ovary, said that the cause of hemorrhage was not evident. He had recently a case of metrorrhagia in a woman of twenty-two years who, following a miscarriage, flowed each month for about two weeks. She had been curetted many times without benefit. He did a laparotomy, opened the uterus and finding no evident cause for the bleeding closed the wound. At the succeeding period the woman flowed fifteen days and then Dr. Vaughan removed the uterus.

DR. CARR reported a case in which the ovaries and tubes had been removed to control uterine bleeding with good effect. He thought that the parovarian cysts were frequently associated with disease of the mucosa of the uterus and suggested that fibroids might cause bleeding by interference with the venous circulation.

DR. LOWE reported a case of hemorrhage in an ovarian cyst, which was cured by oophorectomy. In another case bleeding had been due to arteriosclerosis which could be cured only by hysterectomy.

DR. CARR, discussing the case of cancer of the uterus, was glad to hear the statement that not planning for the operation had increased its duration and the shock. He had had the same experience and thought that surgeons often did not take time

enough to diagnose the cases and plan the operation beforehand.

DR. LOWE called attention to the fact that this patient had a goiter, was very nervous and had a pulse of 140 at the beginning of the operation which slowed down to 110, but most of the time was between 130 and 160.

DR. SPRIGG in discussing the case of parovarian cyst spoke of the possibility of the hemorrhage being due to a physiological disturbance through the nervous system from intraovarian pressure. Injecting an ovary with paraffin caused uterine bleeding curable by removal of the ovaries.

DR. STONE in closing said that the removal of small cysts might control hemorrhage. He thought the suggestion that the bleeding was due to pressure not likely because of the free anastomosis of the blood-vessels.

The essay of DR. JOHN F. MORAN on

CESAREAN SECTION IN ECLAMPSIA WITH REPORT OF FOUR CASES, was read by DR. STONE with the consent of the Society in the absence of the author.

Moran believed that the pathology of eclampsia supports the toxin theory, demonstrates its progressive nature and emphasizes the necessity of prompt emptying of the uterus particularly after the onset of the convulsions. What the method of intervention, if necessary, shall be, must be determined, primarily, by the condition of the cervix and the anatomical and physiological changes which the uterus undergoes during pregnancy and labor. In primiparæ with intact cervix, in multiparæ with like condition, who have never been delivered by the vagina, in cases of unyielding rigidity of the cervix due to scar tissue and where immediate delivery is indicated in the interest of the mother or child, vaginal or abdominal Cesarean section, depending upon the period of gestation, are valuable and rational methods of delivery. He does not wish to be understood as advocating these operations to the exclusion of the other modes of treatment but he recognizes that they are to be preferred to the forcible manual or instrumental dilation or rather divulsion of the cervix with its immediate and remote dangers of shock, deep cervical tears, hemorrhage and infection.

He reports four cases of eclampsia, which occurred in two patients he saw in consultation, in whom Cesarean section was performed, saving both mothers and all of the children. The first patient, primipara, eight months gestation, frequent convulsions, cervix intact, was operated upon by Dr. I. S. Stone, and the second was operated upon at term, under like conditions, in three successive labors, by Dr. W. P. Carr.

Kellitz, in 1897, collected twenty-eight cases of eclampsia operated upon by Cesarean section with a maternal mortality of 50 per cent. and infantile mortality of 62 per cent. Streck-eisen in 1903 collected twenty-eight cases, twelve mothers died and nine infants were dead or died shortly after birth. Hillman in 1899 collected thirty-nine cases and reported one of his own giv-

ing a mortality of 50.5 per cent. for the mothers and 43.2 per cent. for the infants. All but seven of these cases were previously reported by Kellitz or Streckeisen. Moran has collected fifty-three cases, including the four herein reported, operated upon from 1901 up to the present time. Seventeen mothers died (32.32 per cent.). Forty-five infants were born alive, seven were stillborn and four are not mentioned. Altogether 116 cases have been reported with a maternal mortality of 49 per cent. While the statistics of the last decade show a marked improvement over the previous ones, the mortality is still far above the general death rate of eclampsia. A careful analysis of the cases, however, shows that many of the patients had been subjected to other methods of treatment and were moribund at the time of operation. Abdominal and vaginal Cesarean section are not proposed as substitutes for the other methods of intervention in eclampsia but the claim is made, that they have a well-defined field of application in certain cases of eclampsia. If they are to have an established place in the treatment of this complication the indication for which they are urged, must be met by prompt elective action, for to delay until the patient is *in extremis* and all other treatment has failed, is to invite disaster.

#### DISCUSSION.

DR. CARR said that in the treatment of eclampsia until a few years ago induced labor had been the usual routine. Under this treatment the convulsions had continued and the mother had been lost in many of the cases. The children have been lost in fully as many cases. Since the introduction of Cesarean section for the treatment of eclampsia he had personally had four such operations and all the mothers and children were living and well. He believed that eclampsia was due to toxic products squeezed out of the uterus and into the mother's blood by the labors so that in cases where eclamptic convulsions come on early in labor he believed that Cesarean section was the best treatment and the abdominal route should be preferred to the vaginal if there was any question as to the delivery through the pelvis. The mortality of the abdominal operation was below 2 per cent. and the vaginal operation lower than the abdominal.

DR. MAGRUDER had seen one of Dr. Carr's cases. After the first Cesarean section the albumin and casts that had been present in the urine disappeared in a week. In her second pregnancy albumin appeared at the fourth month and she was put on a diet, given salines and flushing of the kidney in order to avoid the toxemia and eclampsia; the headache, however, persisted and when the first convulsion came she was operated on again. She had a great deal of albumin in the urine with hyaline and granular casts, but all cleared up in eight days. She again became pregnant, the albumin appeared earlier and with the



first convulsion again she was operated on. Since then the albumin has never disappeared.

DR. LOWE said that he too had seen this case and not long ago had tended the oldest child for diphtheria. All three of the children at present were exceptionally robust. Several months ago the woman had had a uterine hemorrhage after which an organized blood clot had been found in the cervix.

DR. WILLSON noted that operative interference in these cases was becoming more common and more effective. The expectant treatment followed up as outlined by Hirst was not generally acceptable. Interruption of pregnancy was indicated. In the premature cases it was feasible to do a vaginal section, but near term the abdominal section was preferable. Dr. Little had recorded twenty-six cases in which one mother had been lost. Thirteen had been treated expectantly and nine of the babies lost; while the other thirteen delivered early had lost only four of the babies. He thought that the eclampsia in the three successive pregnancies was so unusual as to suggest renal convulsions rather than eclampsia.

DR. SPRIGG had had four vaginal sections for eclampsia and one abdominal section for the same cause. In the abdominal section the woman was a primipara with a contracted pelvis and both mother and child had been lost. In the vaginal cases one child had been lost from toxemia.

DR. CARR had made the diagnosis of true eclampsia in his case by the clinical appearance of the patient, unconsciousness, face red, conjunctiva and vessels red. In the renal convulsion he had found the face pale and the muscles relaxed from the coma.

DR. STONE in closing spoke of the pernicious nausea and the toxemia cases as needing the same treatment as eclampsia. He was sorry that the preventive treatment could not do more to ward off the eclampsia.

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*Meeting of December 12, 1911.*

*The President, DR. SPRIGG, in the Chair.*

DR. I. S. STONE presented a case of  
PARAVAGINAL ADENOFIBROMA OF THE PELVIC FASCIA OR OF  
MÜLLER'S DUCT RESEMBLING A GREATLY ENLARGED  
VULVOVAGINAL GLAND.

Mrs. I. F., mulatto, aged thirty-nine, was admitted to Columbia Hospital in November. She had two living children, the younger eighteen years of age. She had always had good health and no signs of venereal disease. Three years ago, she was admitted into another hospital and had a large vulvovaginal gland removed but which soon began to grow again and caused her much inconvenience, but never much pain. On admission we found an oval tumor situated in or under the left labium



majus, with a smooth surface and resembling a large inguinal or obturator hernia. The growth was firmly attached and its removal a most interesting process. It closely resembled a hernia but was soon found to be nearly solid and without any evidences of glandular structure. The tumor mass extended under the pubic arch and along the vaginal wall to a point very near the cervix uteri. Its larger extremity was below the pubic arch while its intrapelvic end was much smaller although fairly firm and of a rounded or rope-like form. The ramus of the pubis on the left side was laid bare by the dissection, and we could easily feel blood-vessels pulsating in the region of the obturator and uterine arteries. The tumor was entirely subperitoneal, but we were unable to find any attachment to pelvic organs other than those mentioned. The length of the tumor is about 6 inches and its diameter at its lower extremity is 4 inches. It is somewhat flattened laterally and is made up of large lobules resembling collapsed coils of small intestine but without lumen.

*Pathologist's Report.*—"The large tumor mass from the left labium of your patient is found to be a very vascular, edematous adenofibroma. An interesting feature of this tissue is the great number of large blood-vessels and cavernous spaces or sinuses, roughly simulating erectile tissue. This may be an angiomatous condition. The glandular structures are grouped in areas in the fibrous tissue and are of the mucous type, with high columnar epithelium, arranged around large dilated ducts which contain a colloid-like material."

Fibromas from the subcuticular tissue of this region are not uncommon; adenomata arising from Bartholin's glands are exceedingly rare.

DR. GEORGE TULLY VAUGHAN reported a case of

#### ECTOPIC PREGNANCY COMPLICATING APPENDICITIS. OPERATION THROUGH THE GRIDIRON INCISION.

A colored girl fifteen years old was admitted to Georgetown University Hospital Nov. 27, 1911, suffering with severe pain in the abdomen. For two or three years she says she has suffered with abdominal pain, coming on at irregular times, worse in the right side in the region of the appendix. Has had several attacks this year, sometimes accompanied by vomiting. The attacks would usually subside in two or three days. Menstruation she says is usually regular and free from pain and lasts five days. Last menstruation was Nov. 6 and lasted only four days. The last attack of pain came on Nov. 27 with griping pain in the abdomen, all over but worse on the right side, with nausea. Examination next day: Pulse 80, temperature 99, right side of abdomen tense but not tender or swollen. Diagnosis, catarrhal appendicitis. Operation advised and accepted. Gridiron incision on right side permitted the delivery

of the appendix which was 2 1/2 inches long, slightly swollen and congested and bent on itself at an acute angle owing to the peculiar attachment of the mesoappendix. It was removed and the pelvic organs were examined by palpation. The uterus could be felt but the right ovary could not be recognized. In its place was a smooth mass, giving the sensation of an adherent cyst. While palpating, the mass suddenly ruptured and about an ounce of dark blood clots escaped followed by a small quantity of red blood, which soon ceased. Two of the clots resembled membrane and were saved for further examination. Under the microscope chorionic villi were clearly seen, but the embryo was not found. The patient recovered without incident.

While I do not recommend this method of operation in ectopic gestation, yet this case shows how easy and simple the operation is when done in time.

DR. PRENTISS WILLSON reported a case of

#### VENESECTION IN POSTPARTUM ECLAMPSIA.

Mrs. P., age twenty-three, primipara. Last menstruation Feb. 17, 1911. Labor reckoned for Nov. 24, 1911. Case came under the care of Dr. Willson, in September, who made frequent urinalyses and noted the presence of albumin for the first time Nov. 17. He requested a twenty-four-hour specimen of urine which was not obtained until the 19th. This showed a marked trace of albumin. Milk diet and eliminative treatment ordered. Nov. 20 the excretion of urea was 16 grams and on the 21st the urea output was 10 grams. Blood pressure over 180. Apparatus defective, so that the exact pressure was not registered. Labor began at midnight and ended at 1.20 P. M. the 22d, perfectly normal. L. O. A. Loss of blood very scant. Only one vaginal examination and that was made when the head was on the pelvic floor. Cord around the neck twice and was severed before delivery. First degree laceration closed without anesthetic. No anesthesia during labor. 7.30 P. M.: Patient complained of severe headache; pulse very full. Blood pressure not taken. Nitroglycerin 1/100 grain every four hours, ordered. Had voided urine since birth of child but the amount was not measured. At 8.30 P. M. had a convulsion. Unconsciousness lasted but a short time. Hot pack given and patient perspired freely. Voided urine several times during the night. Nitroglycerin continued and Epsom salts administered. Bowels moved twice. Perspired freely all day of the 23d and voided 21 ounces of urine at 1.20 P. M. and 20 ounces at 5 P. M. In the afternoon was drowsy, restless and complained of headache. Mind clear. Lochia free. At 7.15, twenty-three hours after the first convulsion, the second seizure occurred and others followed at intervals of five to ten minutes. Dr. Moran was summoned by Dr. Willson and reached the bedside when the patient was

having the third convulsion. The pulse was 80 and coma profound. Venesection was at once agreed upon and performed by Dr. Willson. Twenty ounces of blood was taken from the median basilic vein. The convulsions, ten in number, continued throughout the blood-letting. Coma profound and edema of the lungs marked. Pulse 144 and blood pressure 120. Patient placed in hot pack at onset of convulsions and two hypos of morphia, gr.  $\frac{1}{4}$ , administered at intervals of two hours. Salt solution by rectum by slow method was begun at midnight and two quarts were given; most of it was retained. About 11 o'clock the pulse was observed to be decreasing in frequency and the edema of the lungs lessening. The following morning, 24th, 7.15 P. M., the pulse was 93 and respiration 16. At 9.15 A. M. 22 ounces of urine removed by catheter contained a marked trace of albumin. At the next catheterization at 4.10 P. M. 36 ounces were removed and showed only a very faint trace of albumin. The coma and morphine narcosis gradually lifted in the afternoon and by evening the mind was quite clear. The puerperium was complicated by sapremia which yielded to a single intrauterine irrigation of normal salt solution. Convalescence otherwise uninterrupted and the urinalysis made Feb. 1, 1912, showed the urine to be normal. The patient was in excellent condition, and nursing the child which was also thriving nicely.

The points worthy of note in this case were as follows:

The absence of the usual manifestations of impending eclampsia save the presence of albumin and the increased blood pressure emphasizes the importance of a routine examination for these danger signals.

The small amount of blood lost during delivery was also of significance, particularly when associated with the other signs.

The marked secretion of urine and the lateness of the onset of the convulsions after delivery, would seem to indicate that nature was endeavoring to throw off the toxins, and had there been free bleeding before or during labor the eclampsia might have been averted.

The mere report of the clinical phenomena of this case gives but a faint idea of its gravity. With the patient in the throes of the convulsions, with a pulse of only 80, the outcome seemed very hopeful, but the recurring convulsions, deepening coma, rapidly quickening pulse and the supervening edema of the lungs made the favorable prognosis doubtful. I am firmly convinced that the saving of the patient's life was largely if not solely due to the prompt blood-letting.

DR. ABBE presented a

#### CASE OF ENTEROPTOSIS.

M. F., a white woman thirty years of age, unmarried, of slight figure, was operated on eight years ago for abdominal pains and the appendix removed. The pains persisted, became worse on



the right lower portion of the abdomen and she was operated on again for a right femoral hernia. As the pains still continued and grew worse another laparotomy was done separating adhesions from the cecum to small intestines and from the old laparotomy scar. This was followed by considerable temporary relief but the condition did not clear up and a series of skiagraphs were taken showing the stomach with its lesser curvature an inch below the umbilicus, the lower border of the liver down to the crest of the ilium, and the small intestines all in the true pelvis. The spleen and kidneys were in their normal positions. The skiagraphs were demonstrated. The patient is still under treatment; no operation, however, has as yet been deemed advisable.

#### DISCUSSION.

In discussing Dr. Vaughan's case, DR. STONE emphasized the importance of making a vaginal examination in all abdominal work, and of training students in the elementary work of simple examination and normal conditions before teaching them the details of a laparotomy.

In discussing Dr. Willson's case, DR. MORAN noted the frequency of the convulsions at the time of venesection and the increase of pulse rate after the venesection. DR. ABBE noted the importance of blood-pressure examinations as routine in pregnancy. DR. THOMAS advocated blood letting in eclampsia.

DR. WILLSON said that Hirst considered a blood pressure of 150 mm. as serious and 180 as indicating treatment, but stated that eclampsia might also occur with a low blood pressure.

DR. W. H. LAWSON read the essay of the evening on

#### ANEURYSM OF THE UTERINE ARTERY.\*

#### DISCUSSION.

DR. ABBE in discussing the case complimented Dr. Lawson on the careful scientific investigation which had led to the unusual diagnosis. He considered that the case had been proven as one of traumatic aneurysm, the aneurysm having been caused by injury during the trachelorrhaphy, which would suggest more care in our surgery to avoid injury to blood-vessels.

DR. VAUGHAN noted the importance of making postmortem examinations to determine the cause of death in every case where the anatomical diagnosis was not previously satisfactory. It also showed the importance of exploratory operations to find the cause of hemorrhage. He noted also that aneurysms at times were caused by muscular action.

DR. WALL asked if Dr. Lawson could give a syndrome characteristic of aneurysm in the cases of late postpartum bleeding.

\* For original article, see page 732.



DR. WHITE asked if an x-ray examination would have revealed the aneurysm in this case.

DR. STONE asked if the laceration of the cervix rather than the trachelorrhaphy could not have caused the aneurysm.

DR. MILLER doubted whether the operation had been the cause of the weakened wall of the blood-vessel.

DR. MORAN thought that the aneurysm explained the previous postpartum hemorrhage.

DR. ABBE doubted the value of an x-ray examination in detecting an aneurysm of such small size, so deeply located, and so close to the heavy uterus.

DR. LAWSON in closing said that the organized clots in the aneurysm sac showed the long standing of the aneurysm and yet if it had been present at the time of the trachelorrhaphy it could scarcely have escaped detection. So that it seemed more reasonable to attribute the origin of the aneurysm to the traumatism during the operation.

### *Meeting of January 12, 1912.*

*The President, DR. SPRIGG, in the Chair.*

DR. I. S. STONE read the essay of the evening on

THE INTERPOSITION OPERATION FOR PROLAPSE OF THE UTERUS.\*

### DISCUSSION.

DR. WHITE in discussing the paper differentiated the types of prolapse and said that no one operation would be the choice for all conditions. In older women he had had recurrences after most types of plastic operation and expected to do a hysterectomy in many cases, supporting the stump by suture of the round ligaments. He noted that pregnancy after the interposition operation would produced bad complications. He did not like the use of the tincture of iodine as a uterine irrigation on account of the danger of forcing it into the peritoneum. He had seen uterine colic follow the use of glycerine and iodine injections.

DR. LEWIS spoke of the anteversion due to the interposition operation as a possible cause of dysmenorrhea. He considered the traumatism and laceration of labor as the cause of the prolapse and suggested Cesarean section as a preventative of the relaxation of the pelvic outlet.

DR. SPRIGG noted the occurrence of prolapse in virgins due to defective fascia of perineum and of the pelvic ligaments. He had done hysterectomy and closure of the vagina in two women past seventy years of age and usually did a plastic in the pelvis and on the vaginal outlet in addition to the hysterectomy. He had had one recurrence after an interposition operation and then he had done a supravaginal hysterectomy. During the

\*For original article see page 722.

child-bearing period he had done a shortening of the round ligaments and sometimes additional shortening of the broad ligaments.

DR. ABBE called attention to the fact that Dr. Stone's operation had been limited in its application by the author to the cases past the menopause and had the advantage of not removing organs but utilizing the displaced uterus to support the displaced bladder.

DR. STONE said in closing that the severest test came in the cases of prolapse of the small uterus but even here he had gotten no recurrences. He emphasized the fact that the operation was not intended for women in the child-bearing age. One case of pregnancy had been recorded following this operation which had gone on to the seventh or eighth month when the woman miscarried and the child had not been viable. The lengthening of the urethra had been the most noteworthy incident in the pregnancy. He noted that the operation had been described by Dr. T. J. Watkins of Chicago, in a publication a few months before Dr. Stone's publication of this method but that the operation had been original with each of them. Dr. Stone's method differed essentially only in the insertion of the first retention sutures into the fascia of the pelvis and body of uterus; while Dr. Watkins had placed his sutures in the vaginal wall and body of uterus. Hysterectomy for prolapse was neither necessary nor satisfactory, because support was needed above for the posited viscera. Emmet's operation for cystocele was not satisfactory, though it might suffice for the perineum.

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*Meeting of February 9, 1912.*

DR. CARR, *in the Chair.*

DR. I. S. STONE presented

A KIDNEY REMOVED FOR NEPHROLITHIASIS.

Mrs. R., white, married. One child. Referred by Dr. Crossen for examination and treatment of suspected disease of right kidney. The patient is a pale young woman who has been in poor health for several years, with pain in region of the right kidney, with loss of flesh and with pus in the urine and the usual symptoms of cystitis. An operation had been performed in another city two years ago for appendical pain, but it was not possible to ascertain the exact condition of the patient at that time, or if she had acute or suppurative lesions of the organ. Radiographs made by Dr. Abbe confirmed the diagnosis of Dr. Crossen that the kidney contained stones, and the woman was operated on January 29, 1912. The examination of the kidney when brought into the wound clearly showed a condition which rendered its removal necessary. The pelvis not only contained stones but much thick mucus, of a colloid appearance.

Stones were also found in various parts of the organ which could not be removed without much injury to the kidney structure. Since the operation the patient has secreted an abundant quantity of urine. The ninth day after operation a single ovoid stone was passed with the urine.

#### DISCUSSION.

DR. MILLER asked if the stone passed after the operation might not have been in the ureter before operation. He noted the importance of examining the second kidney as to its function whenever the possibility of a nephrectomy arose.

DR. KELLEY noted a case where the function of the kidneys had been tested where suspicion of tuberculosis was aroused by the presence of granulation tissue at the ureteral orifice. The kidney on that side had been shown deficient and the other kidney normal, and the defective kidney was removed with uneventful recovery.

DR. LEWIS presented a

#### FIBROID REMOVED AFTER BISECTION.

The patient was referred by Dr. J. L. Lewis of Bethesda, Maryland.

Miss K., age thirty-seven, white. Four years ago she had a moderately severe hemorrhage from the uterus, occurring suddenly during a menstrual period. Two months later another hemorrhage occurred, not severe enough, however, to put her to bed, but she was weak and nervous for some time following. On October 19, 1911, another severe hemorrhage occurred suddenly, which confined her to the bed for five days. On Nov. 19, 1911, she suffered from another hemorrhage, which lasted for ten days or two weeks. The patient had become weak, lost considerable flesh and suffered from fainting spells and dyspeptic symptoms. She had suffered very little actual pain in the pelvis. Pressure symptoms of the bladder and rectum were marked. She was admitted to Sibley Hospital on Dec. 11, 1911. She was found to be a frail emaciated woman, with a rather weak and rapid pulse. Her lungs were in good condition.

A tumor in the lower abdomen was easily seen and on vaginal examination, the finger came in contact with a hard mass filling the lower pelvis and extending to within an inch of the vaginal outlet, though not in the vagina. The cervix could not be felt by the examining finger, the tumor shutting off the approach to it.

On operating the following day the tumor was found lying anterior to the uterus under the bladder and anterior layer of the broad ligament. The uterus and ovaries could not be seen but could be felt in the hollow of the sacrum, behind the tumor. The bladder reflexure of the peritoneum was stretched over the crest of the tumor and extended down behind almost to its



middle. The uterus was distinct from the tumor, save by its proximity.

As there was no chance to get it out by the usual method for fibroids of the fundus uteri, Lewis determined upon bisection of the growth for its removal. Dividing the peritoneum in a longitudinal direction, it was freed from the tumor by dissection. The tumor was then bisected, when with a little assistance with volcellum forceps, it rolled up into the field of operation and was quickly and easily removed.

Where the tumor rested there was left a very extensive raw surface and the redundant peritoneum which had covered the crest of the growth was used to cover this by fixing it with a few catgut sutures.

By first shoving away the peritoneum and pushing aside the bladder before bisecting the tumor, injury to the ureters was avoided.

The patient lost very little blood and left the table in good condition, making an uneventful recovery.

DR. MILLER reported a case where there had been great difficulty in controlling the hemorrhage from a large fibroid and deep clamps had to be used. The patient died of suppression of urine but autopsy showed that the ureters had not been clamped as feared, but there was atrophy of one kidney from the prolonged pressure on the ureter and an acute congestion of the other. In another case where the bladder had been cut into in bisecting the fibroid the bladder had been sutured with no interruption to the recovery.

DR. SPRIGG reported a case of large fibroid associated with a strangulated umbilical hernia in which after doing a radical operation on the hernia the uterus was bisected and removed, both broad ligaments being clamped. The patient died with suppression of urine but the ureters had not been clamped and the suppression was attributed to the anesthesia and shock.

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## ITEM.

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### TRANSACTIONS OF THE AMERICAN ASSOCIATION OF OBSTETRICIANS AND GYNECOLOGISTS.

WE regret to have to state that as the necessary "copy" for the discussions has not been received by the Editors up to the time of going to press, the proceedings of this Society will have to be held over until our next issue.



## BRIEF OF CURRENT LITERATURE.

## OBSTETRICS.

**Pubiotomy.**—S. D. Jacobson (*Surg., Gyn., and Obstet.*, August, 1912) reports ten cases delivered by this method, of which all the mothers were saved and seven babies were born alive. Two women of the series had children subsequent to their pubiotomy about a year later, both experiencing very easy spontaneous deliveries with living children. In each case a moderate pelvic contraction represented the indications for the operation. The technic of the "open" operation done included exposure of the intended line of division of the pubic bone by an incision about 4 inches long, just median to the left pubic spine and almost parallel to the left labium majus. After severing the bone with the Gigli saw, the wound was packed and the skin approximated over the gauze with a series of interrupted sutures temporarily tied. The patient was then slowly brought into the lithotomy position, care being taken not to evert the toes much as this separates the bone ends and tears the soft parts. The delivery was then completed by the forceps or breech extraction. After the delivery of the placenta the uterus and vagina were packed with sterile gauze. Twelve hours after the operation the sutures were untied, the packing removed, and the edges of the wound again brought into apposition, a small rubber tissue drain being left in the lower angle. A dry dressing was applied to the wound and the uterine packing removed. Catheterization every five hours is necessary in these cases, and the patient is permitted to change her position at will. No pelvic immobilization is resorted to. The after-results in the author's cases were invariably good.

**Labor Subsequent to Pubiotomy.**—Deus (*Gyn. Rund.*, Bd. vi, H. 12) presents a study of seventeen personal cases with others collected from the literature and finds that in twenty-five or 31.8 per cent. a more favorable result was obtained in subsequent labors, due to a pelvic enlargement during labor. In only four cases, however, was a direct enlargement noted, marked by an increase in the diameters. In twenty-eight or 25.35 per cent. no enlargement was noted or this was insufficient. ~~The writer~~ He claims therefore that it cannot be denied that after pubiotomy subsequent labors are favorably influenced and even if the enlargement is not permanent there is an undoubted dilatation of the pelvic ring, possibly from a stretching of a fibrous union.

**Echinococcus Cyst as an Obstruction to Labor.**—Gussakow (*Zent. f. Gyn.*, July 13, 1912) reports a case of retrocervical

an operation for enlarging the pelvis by dividing the pubic bone.

tumor which occupied a position in front of the advancing head, and prevented the engagement of the same. A posterior colpotomy was done for the purpose of enucleating the growth, which was found to be extraperitoneal and to consist of a number of cysts presenting the characters of an echinococcus infection. The peritoneal cavity was not invaded and the labor was completed by a forceps extraction rendered necessary by the presence of a slightly flattened pelvis. The cavity was packed with gauze, and three weeks later the capsule of the tumor was removed. The growth seems to have been primary in this location.

**Spontaneous Fracture of the Humerus.**—Jäger (*Gyn. Rund.*, Bd. vi, H. 14) calls attention to the possibility of a spontaneous fracture of the upper arm occurring in normal vertex labors without the intervention of any operative procedure. He reports two cases in which this occurred, in one of which he believes it was due to simply lifting the child's head after it passed over the perineum, thus bringing the flexed arm under the pubic arch. Severe expulsive efforts on the part of the mother favor the production of this lesion. It is advisable, therefore, to examine every case for a possible fracture, even where this is not believed to be probable.

**Toxic Albumin Disintegration Products in Labor and Eclampsia.**—Franz (*Munch. med. Wochenschr.*, July 30, 1912) refers to his previous experiments in which the intraperitoneal injection of guinea-pigs with the urine of pregnancy and labor showed that the toxicity of the urine manifested a proportionate increase during labor which reaches its maximum in the stage of expulsion and diminishes rapidly during the puerperium. Furthermore, he found that the urine of eclamptic cases with little or no renal damage was toxic to a high degree, whereas that from cases of nephritis without fever during pregnancy did not manifest any symptoms of poisoning in the experimental animals. It also appeared that the toxicity of the urine depends on the concentration, the acidity, and the content of true albumin, and it seems probable that in normal labor, abortion, and also in the so called toxemias of pregnancy, especially in eclampsia, an acute toxemia results from the disintegration of albumin. Franz has developed these studies further and believes that a close relation exists between ordinary labor and eclampsia in respect to the development of certain disintegration products. Eclampsia appears most frequently during labor and if it precedes labor, the latter process is usually initiated. There are other points of resemblance which show that the circulatory fluid in eclampsia contains toxic bodies which are similar to those found in ordinary labor. The kidneys become damaged secondarily and the increase in the toxicity of the urine makes it probable that the poison which causes the damage is excreted in this manner. Where there is a functional disturbance or an anatomical lesion of the kidneys, the urinary toxins may be retained in the system.

The function of the kidneys may be tested by appropriate measures and will afford the best evidence as the prognosis of the individual case. From these and other observations, Franz argues that the production of labor is brought about by an intoxication with the products of an albuminoid metabolism, which is favored by the ferment production of placental albuminoid substances.

**The Treatment of Placenta Previa.**—Schweitzer (*Zent. f. Gyn.*, June 22, 1912) presents the collected statistics from Zweifel's clinic in Leipzig during the past decade. One hundred and sixty-one cases came under treatment with a total mortality of 0.9 per cent. for the mothers and 50.45 per cent. for the children. Of the latter there were only seventy-seven viable, and out of this number twenty-nine died (37.66 per cent.). The treatment with rubber dilating bags was particularly studied with reference to its value, and although it is acknowledged that the infant mortality is reduced, the effect as regards the mother has been questioned. Schweitzer collected a series of 670 cases of placenta previa treated by this method in which the maternal mortality was 5.8 per cent. and the general fetal mortality 34.5 per cent., and 27.6 per cent. for the viable children. Compared with a series of 1266 cases done by combined version, the latter show a maternal mortality of 5.45 per cent. and a fetal mortality of 79.35 per cent. It would appear, therefore, as if this procedure had no favorable effect as regards the maternal mortality but seemed to be entirely in the interest of the child.

**Double Ligature of the Umbilical Cord.**—W. Möller (*Zent. f. Gyn.*, July 20, 1912) discusses the necessity of a single or double ligature of the cord in its relation to the third stage of labor. It is claimed that the omission of the ligature of the placental end of the cord permits a more complete anemia of this organ and its consequent easier delivery. Möller has tested this in two series of cases of over 650 each. His results show that if the double ligature was not employed, a well-marked increase was found in the number of placenta which were delivered within the space of fifteen minutes, and that the percentage of placenta not delivered until after the thirty-minute period, was less than in the cases where the double ligature was employed. As the result of carefully weighing a large number of placenta it was also found that the weight of this structure did not have any effect on the time of its separation. It is questionable therefore whether the separation of the placenta from the uterine wall or its extrusion is hastened by a single ligature of the cord.

**Pregnancy Dermatositis Treated with Cord Serum.**—R. Franz (*Zent. f. Gyn.*, July 13, 1912) reports the history of a primipara who developed an extensive erythema multiforme involving the skin of the abdomen and the extremities. An intramuscular injection of 30 c.c. of umbilical serum was made in the thigh. The itching and eruptions began to disappear within twenty-four hours. Another injection of the same quantity was given



two days later in the other thigh. The woman, who was at term, went into labor soon after the second injection and was delivered spontaneously. This report seems to be in accordance with a number of others in which equally good results with serum injections are recorded. The author believes this to have been the true pregnancy dermatosis from tests made with the blood and urine.

**The Treatment of Eclampsia.**—Freund (*Archiv. f. Gyn.*, Bd. xcvi, H. 3) presents his views based on a series of 551 cases treated in the "Charité" in Berlin, in which most of the accepted methods of treatment were employed. The mortality of the series was 17.2 per cent., about equally divided between antepartum and postpartum cases. Among 355 cases delivered by operative means, there were fifty-six deaths, from which he deducts ten cases due directly to the operation. The fetal mortality in the entire series was 11.5 per cent. In view of the unsatisfactory state of the therapeutics of this disease, Freund states that the early operative delivery will hereafter be followed in the two large Berlin women's clinics, and the palliative treatment limited to the cases of postpartum eclampsia. Early and rapid emptying of the uterus was found apparently to give the best results. In judging the effects of this method future statistics must take into account the interval between the first convulsion and the completion of the third stage, and not the number of convulsions antedating labor. After radical delivery Freund believes that the various prognostic measures such as the functional kidney test, etc., must be relied upon to dictate further measures in the treatment. Among the palliative measures venesection is recommended on account of the depressant effect on the blood-pressure, particularly in postpartum eclampsia with a high tension pulse. Freund is personally convinced that an exclusive narcotic method of treatment is valueless.

**Intramammary Injections of Oxygen in the Treatment of Eclampsia.**—Williams (*Jour. A. M. A.*, August 17, 1912) reports a case of postpartum eclampsia in a ii-para, which was treated with morphine, veratrum viride, venesection, calomel and elaterium, hot packs and proctoclysis. In addition, following the suggestion that a toxic substance is elaborated by the breasts, oxygen was introduced into each gland from an ordinary tank. The breasts were completely filled and the gas also found its way into the thoracic areolar tissue as high up as the clavicle. Each breast was then strapped down tightly and a bandage applied. After the treatment was begun only two slight convulsions occurred and the patient rapidly improved. An interesting point in the case is the fact that notwithstanding the extreme distention of the tissues and the tight strapping, the absorption of the gas was very rapid, and the idea is suggested by the author that the effect was due to the direct action of the oxygen on the toxins themselves.



**Bacteriology of Acute Intestinal Diseases.**—Veeder, Kilduffe, and Denny (*Am. Jr. Dis. Childr.*, Aug., 1912) have made a bacteriological study of eighty severe cases of ileocolitis, in every case of which mucus was more or less constantly present in the stools, and the latter were frequently blood streaked. In this type the dysentery organisms have been usually found. The authors believe that the mere presence of a few dysentery organisms in a case of acute intestinal disturbance in an infant does not in itself prove that the organisms have any etiologic relation to the condition. It is only in the severe cases of ileocolitis that the dysentery organisms are present in the stools as one of the predominating types, and it is these cases which show distinctive lesions of dysentery at autopsy. In only 20 per cent. of the cases of ileocolitis occurring in infancy were dysentery organisms found, in some of which the infection was primary, in others probably secondary. The cases of ileocolitis in which dysentery organisms are present cannot be separated clinically from those in which they are absent. Streptococci are present in the stools of about 80 per cent. of the cases of ileocolitis. While in the majority of these cases the relation is unimportant, it is probable that in some instances the organisms have a distinct relationship in the etiology of the condition. In so far as the bacterial picture consists to a large degree of some of the putrefactive group of organisms, the findings are in accordance with those of Kendall. In thirty of the eighty cases a lactose diet was used, and where improvement occurred, the putrefactive organisms were found to disappear gradually as the predominating types, while in those cases not improving, they persisted. In other words, the disappearance was apparently dependent on the condition of the patient rather than on the diet.

**Full-term Abdominal Pregnancy.**—F. N. Yeager (*Jr. A. M. A.*, August 10, 1912) reports the results of an autopsy in a woman aged seventy-two, which showed a mummified full-term fetus surrounded by a calcareous capsule. Coils of intestine were adherent about the mass, but no trace of placenta was found. The patient had gone through a missed labor in 1877, thirty-five years before her death. Subsequently she suffered from pressure symptoms, including ascitis, for the relief of which she was tapped on several occasions. Death was due to an attack of apoplexy. The case is interesting for the length of time during which this pregnancy, which evidently resulted from a tubal abortion, was continued in its new site without causing marked symptoms.

**Serodiagnosis of Pregnancy.**—Abderhalden (*Münch. med. Wochenschr.*, June 11, 1912) contributes a further research in which changes in polarization and modified dialyzation methods are employed. His theories are complex and cannot be abstracted, but in brief he claims that the blood is protected against specifically characteristic cell constituents as it is against the complex compounds that constitute food; that is to say, before either

can be absorbed by the blood they must be broken up into simpler elements. Under normal conditions the various cells undergo a breaking up before they pass into the blood, in the course of which they lose their characteristics. If, however, the original cell constituents find their way into the blood they behave like foreign bodies and can be detected by suitable tests, including those already referred to. In line with this theory Abderhalden now claims that the chorionic villi during pregnancy give off cellular elements which are taken up by the blood and constitute a foreign body in the same. By means of the tests which he describes, he claims to have been able to make a positive diagnosis of pregnancy in seventy-five cases without error. It is also believed that the etiology of eclampsia may be cleared up by this means, for it seems possible that the disintegration of elements foreign to the blood is either increased or diminished in this disease. On the other hand, it may be that the chorionic villi possess an abnormal structure in such cases. The investigations seem to have shown that the ferment production does not produce the toxic materials, as no differences were evident in the ferment from eclampsia or normal pregnant women. A large field for future research is opened up by these investigations.

**Criminal Abortions.**—A. Brun (*Zent. f. Gyn.*, June 1, 1912) considers that the responsibility for the frequency of criminal abortion rests largely on the physician and that steps are necessary to institute a more effective control of the evil, particularly as regards the private maternity hospitals, professional abortionists and midwives. The writer believes that a more accurate knowledge of the dangers attending this operation should be disseminated among the laity and thinks that good results may be obtained in a manner similar to what has followed a dissemination of the knowledge among women of the early symptoms of cancer of the uterus. Midwives as a class produce a great many abortions, but it is believed that a more careful training and supervision will in time overcome this condition. It is also unfortunate that many physicians, particularly neurologists and internists, are apt to ascribe a great many conditions to the presence of a pregnancy and therefore advise an interruption of the same. Brun believes that if the indications are more closely drawn and the operation regarded as of a major character, the production of abortions in healthy women would be much less frequent. The struggle for existence among women as a class constitutes a serious menace to marriage and maternity and likewise the laws which regard the mother of an illegitimate child as a criminal. The writer believes that prophylactic measures against criminal abortion are of much greater importance than the promulgation and execution of laws for the punishment of this condition. It is necessary therefore that the "International Committee for Combating Criminal Abortion," which has already been in existence since 1908, should take steps to call attention to the various evils attending the same.

**The Reaction of the Blood Serum in Normal and Pathological Conditions.**—Rolly (*Munch. med. Wochenschr.*, June 4, 1912) presents the results of an extended series of hematological observations in the human subject and animals, which contains much of interest to the obstetrician. The alkalinity of the blood was determined by titration, by the carbonic acid content, by the employment of various indicators, or by making a quantitative analysis of the mineral constituents. Furthermore, an attempt was also made by indirect means to draw conclusions from the quantitative determination of the ammonia excretion in the urine and likewise the estimation of the carbonic acid pressure in the alveolar air. Rolly believes that these methods, however, are not suitable for any accurate estimation of the absolute alkalinity of the blood serum, whether in the healthy or in the sick individual and a much more definite result is claimed to follow the employment of such gaseous tests. The blood serum in all individuals, whether healthy or sick was found slightly alkaline and only in diabetic coma could the reaction be regarded as acid, for in these cases, the concentration of the hydrogen ions was greater than that of the OH ions. This seems to confirm the theory, therefore, that the cause of diabetic coma resides in an acid intoxication, although it is not unlikely that in addition a toxic process is also involved. In a great many, but not in all diabetic patients who have a severe form of the disease, an abnormally low alkalinity of the blood serum is present. It was noted that the degree of this alkalinity does not run along in a parallel direction with the acid excretion in the urine. In diabetic cases of a moderately severe or a slight degree the alkaline content of the blood serum is usually within normal boundaries. On the basis of these results Rolly denies the claims of the writers who assume that the cause of the symptom-complex which characterizes a uremia is not an acid intoxication, because in the blood serum of moribund cases with completely intact kidneys, the alkaline values may be just as low as in conditions of uremia. In a certain proportion of uremic cases, the reaction of the blood serum was found practically normal and only became abnormally reduced in those patients who died within the next few days. In nephritis, without uremic symptoms, the reaction of the blood is normal in a certain proportion of febrile cases and the reaction of the blood serum is apparently somewhat reduced, but in others not at all. This condition likewise exists in patients suffering from arteriosclerosis. In puerperal eclampsia the alkaline values are reduced, but not abnormally so. The conditions found in the blood serum of patients with tubercular meningitis are noteworthy infrequently showing a high alkaline content. Patients afflicted with acute yellow atrophy of the liver and in most of those presenting a sclerosis of the liver, abnormally high alkaline values are present. The blood of these patients resembles in this respect that obtained from dogs in which an Eck's fistula



has been made. On the other hand, in dogs in which the liver was removed, the alkalinity of the blood became remarkably low.

**Clinical and Bacteriological Study of Laminaria Dilatation of the Cervix.**—B. Strauss (*Zeitschr. f. Geb. u. Gyn.*, Bd. lxx, H. 1) presents the record of a series of 400 cases in which this method was largely employed for dilatation previous to exploration of the interior of the uterus. Strauss believes that the advantages in comparison with other methods of dilatation reside largely in the absence of narcosis. The introduction of tents is painless if carefully done, and likewise the period of dilatation. In very nervous and sensitive patients, however, a small dose of opium is indicated. Tents, moreover, cannot cause any lacerations of even the smallest degree. It is essential to have different sizes at hand and to employ as a gauge the ordinary graduated Hegar dilators. Premature expulsion of the tent is avoided by a vaginal tamponade. The danger of infection during this manipulation is largely done away with by the employment of the thoroughly sterilized laminaria which are now in the market. The author made a careful bacteriological examination of a series of sixty cases and found that, notwithstanding the most careful aseptic precautions, the ascending infection by vaginal bacteria cannot, however, be entirely avoided and it was possible to demonstrate an acute exudative endometritis in a certain percentage of the cases, although the clinical significance of the same is of little consequence. In this series of 400 cases a rise of temperature was noted in only 7 per cent. and in no case did any additional complications result. Regarding repeated introduction of tents as an element in infection, Strauss found that in thirty-nine cases where two tents were successively introduced, a rise of temperature occurred in only two and in three cases in which three introductions were made no rise of temperature resulted.

**Pituitrin as a Postoperative Tonic.**—R. T. Jaschke (*Münch. med. Wochenschr.*, July 25, 1912) presents the results of a systematic trial of this preparation in a series of forty-four cases, including a variety of plastic and other gynecological operations, with especial reference to the bladder function. In twenty-one instances the bladder was spontaneously emptied on the day of operation, avoiding the necessity of catheterization. In fourteen cases spontaneous urination occurred on the second day, and in five cases there was no result. The drug also acts as a cardio vascular tonic and, as compared with adrenalin, its action in overcoming shock is very much more prolonged.

**Holding the Uterus in the Third Stage of Labor.**—J. Reich (*Zent. f. Gyn.*, July 27, 1912) calls attention to the value of this procedure which has already been extensively employed in this country. He considers that manual control of the uterine fundus after labor is the best method for avoiding postpartum hemorrhage. As the result of the adoption of this method in a



series of 800 cases, in not a single case was a tamponade of the uterus required. The method is also applicable by the ordinary midwife, who, the author believes, should be legally directed to give her whole attention to the fundus uteri after the birth of the child.

**Transmission of Maternal Organisms to the New-born Child and also Indirectly to the Mother.**—Lindermann and Noack (*Zent. f. Gyn.*, July 27, 1912), working in Veit's clinic, claim that there is a possibility of carrying germs from the vagina of the mother into the mouth, the umbilicus, and the breasts of the child. They likewise support the contention of Bonhoff and Esch that a fatal meningitis will result from aspiration of vaginal bacteria and their further progress through the Eustachian tube into the middle ear. Puerperal mastitis may likewise be produced by the transmission of maternal infectious material through the agency of the infant's mouth. In two cases of puerperal mastitis the same organism was obtained in pure culture from the vagina and this was likewise found in the mouth of the child. The same organism was also found in a case of stomatitis in an infant, combined with vulvitis.

**The Study of the Syncytium.**—Kiutsi (*Zent. f. Gyn.*, July 27, 1912) in his studies on the biology of the placenta, found that previous conclusions were based on the results of the study of mixed tissues, which in addition to the principle element, the syncytium, also contained components biologically different. Serological studies thus far made have been based on careful isolation of this tissue from the placental villi, but Kiutsi concluded that the material obtained from the cysts of hydatid moles would permit a much more careful isolation of the desired syncytial tissues. From this he prepared an extract which was employed in a variety of experiments, as the result of which he concludes that the serological and chemical processes in the placenta can only be studied in such isolated syncytium because it represents the specific placental cells. This may be procured in a purely mechanical manner from hydatid cysts. The isolation of placental cells, which consist of a mixture of syncytium and Langhans' cells is even more readily brought about by this method. The cells thus isolated do not suffer any chemical change and are therefore adapted both for the biological and chemical studies on the placenta.

**Puerperal Pyemia.**—Warnekros, of Bumm's Clinic (*Archiv. f. Gyn.*, Bd. xcvi, H. 1) summarizes an excellent clinical paper on this subject as follows: The temperature curve in pyemia affords a definite knowledge of the beginning of a hematogenous infection and likewise to a certain degree the anatomical extension of the same. If after a more or less prolonged course of temperature, a chill is ushered in, which is repeated during the next few days and marked by extended remissions to the normal or below, it may be stated that the primary fever is due to the local endometritis and that the chills must be regarded as a sub-

sequent thrombophlebitis with the entrance of the germs into the blood. If after a more or less prolonged atypical temperature curve, a high continuous fever without chills sets in, then the case may be regarded as a direct invasion of the veins by the bacteria without any primary thrombosis, of which the point of entrance is either the placental site or an accidental injury to the mucous membrane. The clinical symptoms may be controlled and confirmed by a bacteriological examination of the blood. As long as the endometritis remains localized, the blood must be free from germs. With the onset of the chills, especially if these continue, the demonstration of the germs in the circulation is usually possible, although in the pyemic form of sepsis the germs will usually be found in the blood only during the chills. The condition is a permanent one in true septicemia. The thrombotic form must be regarded therefore as affording the more favorable prognosis because the blood is free from bacteria during the intervals between chills. Operation is therefore indicated as soon as the localization of the process is determined. The ligature of the affected veins results in definitely cutting out any further access of bacteria to the circulation. The most favorable site for the application of the ligature is on the common iliac vein of the affected side. If the thrombotic process, as in some of the author's cases, extends beyond this point, the vena cava itself may be tied off without fear of subsequent obstruction, for a collateral circulation is undoubtedly established in such cases. The efficiency of this method of treatment is shown in the cases in which an examination of the blood before operation regularly showed a bacteremia during the chills. After ligation the latter did not return and the blood remained free from organisms.

**Is Eclampsia an Immunity Reaction?**—Bauereisen (*Zeitschr. f. Geb. u. Gyn.*, Bd. lxxi, H. 1, u. 2) has made a series of experiments in rabbits and guinea-pigs in which intraperitoneal, intracardial and intravenous injections of testicular and placental extracts and also fetal serum were made, the material being taken from the same species of animals. He found that the placenta as well as the testicles possessed the characters of an antigen and were therefore capable of giving rise to an immunity reaction although this property was developed to only a moderate degree. Bauereisen believes, therefore, that the functional disturbances of the nervous system and the digestive organs as well as damage to other vital structures in the body, which appear during the early months of pregnancy, are dependent either on immunity processes or are due to physiological and pathological products of the placenta. Eclampsia, on the other hand, has no uniform etiology. The causes of the disease must be sought for in the products of the immunity induced by the placenta as well as in the primary and secondary toxic activity of definite albuminoid combinations of the placenta and maternal organisms.

**The Present State of Abdominal Cesarean Section.**—Reuben

Peterson (*Surg., Gyn., and Obst.*, July, 1912) discusses the subject in the light of present day results under the following headings:

1. In contracted pelvis is Cesarean section or the induction of labor, most advantageous for mother and child? The advantages of the induction of labor lie in the absence of maternal mortality if proper methods are employed; but, on the other hand, there is a considerable fetal mortality connected with the procedure which probably no improvements in diagnosis or technic will ever materially lessen. The living fetus should always be the most essential part of the obstetrical problem and its interests guarded in every way. Aside from the question of absolute contraction it should not be forgotten that the exact measurement of the true conjugate diameter cannot always be made with exactitude and its length is only approximate. Peterson believes that in the interest of the child the Cesarean section at term or pubiotomy will in time be considered more favorably than the induction of premature labor. 2. Under what conditions is craniotomy on the living child indicated in preference to Cesarean section?

This depends on whether the mother is septic, the fetus feeble and not likely to survive under any conditions, when the fetus is a monster or badly deformed, and when from the necessities of the case either craniotomy or Cesarean section must be performed by unskilled hands. 3. In what cases of contracted pelvis is pubiotomy preferable to Cesarean section? This must be limited to cases of pelvic deformity where the conjugate is 7 or 7.5 cm. or less, and it is only in cases where the diameter varies from 7.5 to 9.5 cm. that the two operations compete with each other. In primipara it is impossible to determine the result except by a test of labor, hence elective Cesarean section is not justifiable. Peterson believes that if three of four hours' second stage shows that spontaneous delivery is not going to take place and traction with the forceps fails to accomplish anything, it is best to perform pubiotomy in place of Cesarean section since the results are better. Where sepsis is present both operations are contraindicated in favor of craniotomy.

4. Under what septic conditions is Cesarean section indicated or contraindicated? Peterson favors the classical Cesarean section using a 6-inch incision, half above and half below and to the left of the umbilicus. The uterus is incised before delivering it through the abdominal incision and no gauze packs used. If the placenta presents it is cut through or pushed aside and the child delivered feet first. The removal of the placenta is followed by the careful removal of the membranes and only when there is excessive oozing does the assistant grasp the broad ligament. The myometrium is brought together with a continuous, number 2 twenty-day chromic catgut, and the peritoneal surface with a continuous silk Lembert suture. The abdominal wound is closed in layers, and no gauze is used in the cervix for drainage. The after-treatment is the same as for any laparotomy or puerperal patient.



**Lipoid Content of the Placenta.**—Bienenfeld, of Schauta's Clinic (*Monatsschr. f. Geb. u. Gyn.*, August, 1912), has examined a considerable number of placenta, full-term as well as from the early months, likewise from eclamptic and syphilitic patients. The tissues were freed from blood and then prepared with sodium sulphate as a dried powder, which was subjected to extraction with petroleum ether for five days. The resulting extract was then studied for its total content of neutral fats and lipoids. In 100 gm. of the dried powder this extract varied from 3.59 to 8.59 gm., and seemed to be greater in amount in the placenta of early pregnancy than in those from eclamptic cases, while it was about the same in normal and syphilitic placenta. The amount of free cholesterin in the same quantity of material varied from 0.155 to 0.495 gm. being most in the placenta of early pregnancy, and least in those from eclamptic patients. It was also found that the petroleum ether extract of full-term placenta contained phosphorus only in traces, the phosphates being markedly increased in the placenta of early pregnancy, eclamptic and specific cases. The lipoid content of the full-term placenta was found to average about 0.42 per cent., whereas that of early pregnancy showed 2.49 per cent. The lipoid content of eclamptic placenta (0.44 per cent.) equals that of the normal placenta, and this is slightly increased in syphilitic cases. The neutral fats seemed to be diminished in normal pregnancy, whereas the eclamptic placenta showed a higher content (4.8 per cent.) and those from syphilitic cases a lower figure (2.8 per cent.).

**Manual Extraction of the Placenta.**—Rogoff (*Monatsschr. f. Geb. u. Gyn.*, August, 1912) has studied the material of the Moscow Maternity, which includes over 52,000 labors, among which a manual extraction was done in 1243 cases, including 474 at term. The author does not believe that the procedure is as dangerous as many claim, although care in its execution is essential. Rogoff states that the retention of placental tissue in the uterus depends on incorrect conduct of the third stage of labor and, although adhesions to the uterus undoubtedly occur, they are probably not present in many cases where a manual extraction has been done. Before the latter procedure is resorted to, a Credé expression under anesthesia should be attempted. It was found that the mortality after manual extraction was not of moment if no severe infection occurred before admission to the hospital, and with care, the morbidity is likewise very low. Rogoff considers that an intrauterine douche with a germicidal solution soon after the delivery of the placenta, an ice-bag to the fundus, and vaginal douches if the lochia become foul, are all essential factors in the production of a normal puerperium in such cases.

**Vaccines in the Treatment of Puerperal Sepsis.**—R. J. Rowlette (*Jour. Obst. Gyn. Brit. Emp.*, 1912, xxi, 319) has used vaccines in thirty-one cases of streptococcal and eight of staphylococcal puerperal infection and in fifteen cases in which no bacteriological diagnosis was made and in which vaccines of one or other organ-



ism were empirically given. The results of the series as a whole were decidedly encouraging. The writer concludes that vaccines, given in small doses, do no harm in puerperal sepsis. In the great majority of cases they do good. In many cases they produce immediate and remarkable improvement. Autogenous are more trustworthy than stock vaccines, and sometimes succeed rapidly where the latter fail. Antistreptococcus serum given simultaneously increases the effect of streptococcal vaccine. To get the best results accurate bacteriological diagnosis is necessary.

**Extraperitoneal Cesarean Section.**—A. W. Russell (*Proc. Roy. Soc. Med., Obst. and Gyn. Sect.*, 1912, v, 306) discusses this operation on the basis of seven cases. He says that extraperitoneal Cesarean section is not an alternative to the ordinary classical operation. Its technic is more complicated and it usually takes a little longer time. The classical operation should be chosen for ordinary cases, and the extraperitoneal operation should be complementary to it and reserved for cases advanced in labor with the lower uterine segment stretched by the overlapping head or the impacted shoulder or for certain cases of placenta previa, the child being still alive. The healing of the wound has been proved to be quite as satisfactorily secured as in other methods when the right technic is employed. The different structure of the lower uterine segment and cervix favors healing because it is not subject to the disturbing contractions of the uterine body. The patient stands a much better chance of her life with an infected uterine wound if it is extraperitoneal. The risk of hemorrhage is certainly not greater. It is usually less. There is no risk of hernia or of intestinal complications. Perhaps the most important consideration is the added scope that this method gives for the attainment of the ideal of Cesarean section,—the saving of the life of the child as well as that of the mother. There are certain cases of impacted, neglected, transverse or oblique presentations, central placenta previa, and even such a complication as the obstructing retraction ring, which come only or best within the scope of this operation.

**Clinical Significance of Acidosis in Pregnancy.**—W. C. Swayne (*Med. Press.*, July 17, 1912) says that administration of chloroform to a patient with acidosis should be avoided and chloroform should not be used for patients suffering from eclampsia. An increasing acidosis should be looked upon as an additional indication for terminating pregnancy in cases either of albuminuria or severe vomiting. To the ordinary treatment of these conditions should be added measures directed to the correction of the acidosis.

**Tincture of Iodine in Preparation for Labor Cases.**—McDonald Watkins (*Surg. Gyn. and Obst.*, 1912, xv, 120) recommends application of tincture of iodine to the cutaneous portion of the vulva and adjacent skin, after clipping the long hairs, as an efficient means of rapid sterilization before labor.

## GYNECOLOGY AND ABDOMINAL SURGERY.

**Bismuth Paste.**—F. McK. Bell (*Jour. A. M. A.*, 1912, lviii, 1339) states that bismuth paste as a drainage for acute suppurating sinuses is painless and efficacious, but does not assist in rapidity of cure. When a sinus shows sluggishness, if 5 per cent. iodoform be added to the bismuth paste it is much more stimulating to granulations. As a packing and drainage for localized intraabdominal and pelvic sinuses, bismuth paste is safe, painless, rapidly curative, prevents the formation of pockets of pus, lowers temperature and to a limited extent prevents post-operative adhesions. It may be used as an aid to diagnosis in fecal fistulas as well as act as a curative agent. In large cavities requiring four or more ounces of paste the patient should be watched carefully for symptoms of bismuth or arsenic (impurity) poisoning. Unless there is free exit for paste it is dangerous. Bismuth "stones" may form in a closed sinus. In clean wounds or those discharging seropus it retards healing and tends to chronic conditions. To get results the discharge should be frankly purulent.

**Intestinal Obstruction; the Toxic Factors.**—H. B. Stone, B. M. Bernheim and G. H. Whipple (*Johns Hopk. Hosp. Bull.*, 1912, xxiii, 161) give a summary of their experimental work. They find that high loop obstruction in dogs causes very rapid death, twenty-four to sixty hours as a rule, even when the loop contains no food material or secretion from the stomach, liver and pancreas. Low loops (ileum) of similar nature are much less rapidly fatal. Surgical drainage of this loop will save the dog's life. Excision of a duodenal loop does not necessarily disturb the animal's health. The material obtained from obstructed loops is toxic when injected into dogs, the high loop material being much more toxic. This material causes profound splanchnic paralysis with extreme congestion of all this area—particularly the small intestine. The toxic material introduced into normal animals produces many changes similar to those found in the animals with closed duodenal loops—namely, low blood-pressure and temperature, excretion of large amounts of fluid into the intestinal canal and fatal shock. This toxic substance given in a single injection causes a reaction in the dog which is almost identical with the picture of anaphylaxis in this animal. The toxic material is not injured by heating at 60° C. for any length of time, centrifuging and filtering. It is not impaired by prolonged autolysis, by pancreatic digestion and bacterial fermentation. Hydrolysis with dilute acids probably destroys it. No such toxic substance may be obtained by autolysis, digestion or putrefaction of the normal intestinal mucosa. Injections of sublethal doses of this toxic material will protect against subsequent large doses and probably prolong life after a closed duodenal loop has been established.

**Use of Iodine in Conservative Surgery of the Uterine Appendages.**

—In the treatment of subacute cases of salpingitis and such pus

tubes as have not reached great size and in some acute gonorrheal cases, I. S. Stone (*Va. Med. Semi-Month.*, 1912, xvii, 105) applies iodine to the cavity of the uterus and if possible to the tubal mucosa by way of the uterine cornua. Using a 2-ounce glass syringe with conical nozzle about two inches long and about an ounce of 25 per cent. tincture of iodine, the uterine cavity is filled and distended with all the force the syringe will permit, for about two minutes. Through a laparotomy incision, the same syringe and the same or one-half strength tincture of iodine is used to strongly distend the tubes if it has been impossible to force the fluid into them through the uterus. Any surgically conservative treatment is then carried out. The tube is lightly attached to the upper border of the broad ligament to prevent its descent and adhesion in the pelvis.

**Deep-lying Abdominal Inflammation.**—C. N. Dowd (*Amer. Jour. Surg.*, 1912, xxvi, 204) records four cases in which the symptoms corresponded with those of appendicitis excepting in the lack of localized pain and spasm, and two others which show that in chronic cases a similar indefiniteness in symptoms may exist when the appendix lies in the depths of the abdomen. It is evident that if the diagnosis of deep-lying abdominal inflammation is to be made promptly it must often be done without the aid of local pain and local rigidity.

**Technic of Securing the Vessels in Pelvic Abdominal Surgery.**—R. Worrall (*Jour. Obst. Gyn. Brit. Emp.*, 1912, xxi, 285) urges exposing, clamping and tying all vessels with catgut ligatures, using a surgical and two additional knots, the assistant slowly taking off the forceps during the tying of the surgical knot, and then taking again the vessel, if a large one, distal to the ligature during the tying of the second and third knots. In over 2000 abdominal sections the writer has had no case of secondary hemorrhage due to slipping ligature, whereas when he practised transfixion and interlocking he nearly lost three patients from this accident. Such disasters result from one interlocking loop pulling off the other when the uterus is raised to examine the pouch of Douglas as the concluding step of the operation. When the broad ligaments are much thickened by acute infective processes and at the same time soft and friable it is not possible to follow the above method. In such cases the author transfixes but never interlocks, using the pedicle needle.

**Uterine Hemorrhage.**—B. Whitehouse (*Lancet*, April 27, 1912) says that uterine bleeding must be considered as a symptom only, and no stone must be left unturned to ascertain its cause. With this in view it is not sufficient to limit the examination to the pelvic organs. The abdomen must be examined for evidence of hepatic enlargement, the blood pressure must be accurately measured upon a sphygmomanometer, and the condition of the vessel walls ascertained. Evidences of syphilis or other constitutional disease should be looked for, and if possible the calcium index estimated. The condition of the heart, lungs, and



thyroid gland must be noted, and if circumstances permit, a bacteriological examination of the uterine blood should be conducted. If the uterus is sterile, and no other cause is found to account for the bleeding, then one may confidently recommend curetting as a therapeutic measure. Where the bleeding is due to a high arterial blood-pressure the tension must be reduced by purgation, nitro-glycerine, and dieting. Purgation will also have its place in depletion of the portal circulation where hemorrhage is due to hepatic cirrhosis. If the calcium index is low menorrhagia will probably be benefited by the administration of this agent, preferably in the form of the lactate. In the case of bacterial infections the writer has obtained good results by thorough and prolonged intrauterine applications such as peroxide of hydrogen, Churchill's iodine, or protargol. Where hemorrhage is due to rupture of degenerated vessels in the uterine wall, hysterectomy appears to be the best and safest procedure.

**Origin of Epithelial New Growths of the Ovary.**—The paper of J. R. Goodall (*Surg. Gyn. Obst.*, 1912, xiv, 583) shows that in the human fetus the testicle and ovary develop analogous efferent vessels; that Pflüger's egg cords, vasa recta, rete ovarii, parovarium and Gartner's duct (divided into proximal and distal, relative to the ovary) are analogous with the seminiferous tubules, vasa recta, rete testis, vasa efferentia, epididymus and vas deferens respectively. These are all of germinal epithelial origin. In the female in the lower vertebrates many of the structures of the fetal ovary persist, which in the higher types of vertebrates undergo absorption. In the human, the rete ovarii and the vasa recta normally disappear. In the human, vestiges of the rete ovarii are found in one out of eleven cases. When present in one ovary it is nearly always present in the opposite organ. Remnants of the vasa recta frequently persist in certain individuals and are more prone to occur in those who have persistent rete ovarii. These structures, though somewhat atrophied, are always found in the adult cow, sheep, pig, rabbit, dog, guinea-pig, and cat; in the aged cow these structures may show their germinal origin by developing abortive ova and abortive Graafian follicles. Instability of fetal rests may readily pass over into new growths. The surface epithelium frequently invades the ovarian stroma, due to lobulations of the fetal ovary. All the foregoing epithelial structures of the ovary are of congenital origin and may be the starting points of new growths. Owing to cicatrization of corpora lutea the germinal epithelium may be drawn deeply into the ovary. Chronic inflammation of the ovary predisposes to cyst formation. These last two conditions are acquired sources of new growth. The germinal epithelium possesses wonderful metaplastic properties; from the same germinal epithelial cells the ovum, the cells of the membrana granulosa, the interstitial parenchymatous cells of the ovary, ciliated, mucous goblet, syncytial, and cuboidal cells may develop. The interstitial parenchyma of the ovary is of germinal origin.



The ovary possesses two structures adapted to internal secretion, the corpus luteum and the parenchymatous cells. The frequency of endothelioma of the ovary as compared with true sarcoma is probably due to the mesothelial origin of the interstitial parenchyma of the ovary.

**Remote Results of Abdominal Hysteropexy.**—Louis Bazy (*Rev. de gyn. et de chir. abd.*, June, 1, 1912) states that on account of dystocia, resulting from ventrofixation of the body of the uterus, this operation has been abandoned by most surgeons; but fixation of the isthmus of the uterus to the wall with suture of the round ligaments has taken its place. The author finds as a result of his own observation that, as a result of this procedure, a pocket is made in front of the uterus and behind the abdominal peritoneum, with the round ligaments on both sides of it where it is possible for the intestines to become incarcerated and cause intestinal obstruction. This actually occurred in one case seen by him. This procedure has been frequently used on account of the freedom that it gave to the uterus in later pregnancies. The author believes that it should be abandoned and other operations should take its place, on account of the danger of intestinal obstruction.

**Dystocia due to Hysteropexy.**—Fruinsholz and G. Michel (*Ann. de gyn. et d'obst.*, June, 1912) give an example of the bad results of hysteropexy in a woman who is still in the child-bearing period. After this operation, strong adhesions had been formed to the abdominal wall and also to the lateral part of the abdomen inclosing the adnexa of one side. A first pregnancy occurred and the child was successfully delivered, but in a second pregnancy, after dilatation was complete it was found, to be impossible to deliver the child by version, on account of the formation of a firmly contracted ring of uterine tissue around the neck of the child. It became necessary to perform Cesarean section to deliver a dead child, and also to remove the entire uterus to prevent further accidents of the same nature. The authors think that we should limit hysteropexy for prolapsus to women who have passed the menopause.

**False Uterine Metrorrhagia.**—Leon Pouliot (*Jour. de méd. de Paris*, July 6, 1912) considers that metrorrhagia is not always of local origin. In puberty it occurs in mitral stenosis and in hypothyroidism. In woman in the child-bearing period it is also seen with cardiac lesions, hepatic stasis, lithiasis, and in leukemia. It is most common in women past the menopause, when sclerosis of the uterine arteries has developed, so that they remain open in spite of ergot and hot douches. The sphygmomanometer will assist in the diagnosis in such cases. The only measures that will assist in controlling such hemorrhages are those that increase the coagulability of the blood in the veins, and those that reduce arterial tension.

**Coagulation Time of the Blood.**—Ebeler (*Monatsschr. f. Geb. u. Gyn.*, August, 1912) from a series of 500 observations conducted

in Engelmann's Clinic at Dortmund, claims that in women the blood is subjected to extreme variations as regards to coagulability. This period seems to be regularly contracted during the latter months of pregnancy, persists during labor, and becomes prolonged during the puerperium, until the normal coagulation time is reached at the end of the second week. During the first six months of pregnancy the blood shows a normal coagulation time. Not only during menstruation, but also in the presence of all other genital hemorrhages, the blood shows a well-marked prolongation of the coagulation time; the only exceptions being the postpartum hemorrhages and the latter months of pregnancy. Extended and repeated hemorrhages produced as a rule an increase in the coagulation time. The same author in connection with Engelmann has also studied the coagulation of the blood in a series of twenty-one cases of eclampsia, and found that in the majority a marked shortening of the coagulation time of the blood could be demonstrated, which would seem to controvert the theory that eclampsia is an anaphylactic process. This observation might likewise explain the effect of the injection of potassium iodide as recommended by Sellheim in the treatment of eclampsia, because this salt possesses the property of reducing the viscosity and the coagulation tendencies of the blood.

**Surgery of the Cervix.**—H. P. Newman (*Surg., Gyn., and Obst.*, July, 1912) describes a manner of operating in this region which is claimed to possess certain advantages in comparison with existing methods, and notwithstanding adverse comments, believes that cervical stenosis, whether of traumatic or congenital origin, is a potent factor in the etiology of much pelvic pathology and an indication of radical error in the hygiene and growth of women. What is known as congenital stenosis is rarely the result of embryonic divergence, but rather persistence of the infantile condition through lack of proper growth during puberty or the developmental period. The author terms his operation "tracheloplasty." It is indicated in all cases where removal or plastic surgery of the lower segment of the uterus is required after dilatation and curetage. The anterior and posterior lips of the cervix are transfixed with a specially devised knife in such a manner that the intervening plug of diseased tissue can be removed with a curved scissors. The excision of this crater-like mass of tissue produces two flaps the edges of which are approximated with six or eight sutures. A uterine tampon of iodoform gauze is next inserted and the vagina likewise packed. This method permits accurate approximation of mucous membranes, avoids granulating surfaces, cicatrices, and constrictions of the canal. It does not require any after-treatment.

**Relation of Pelvic Disease to Mental Disturbances.**—E. A. Schumann (*N. Y. Med. Jr.*, August 3, 1912) believes that operations of necessity should be performed wherever indicated, whatever the mental state of the patient, including destructive inflamma-

tory disease of the adnexa, malignant tumors in their operable stage, and benign growths causing marked symptoms. Purely elective operations should not be performed upon the insane unless after careful consideration and study of the indications with the alienist it is determined that the benefits accruing from the operative procedure will more than counterbalance the shock and strain incident to the anesthesia and the pain involved. Operative procedures designed merely to produce some reflex or other not understood effect upon mental disorders, and practised without defined pathological basis, are absolutely unjustifiable. This includes the extirpation of healthy ovaries, indiscriminate dilatation, curetage, etc. Schumann believes that the keynote of gynecological treatment among the insane is conservatism, and that insanity already present must be considered as a serious contraindication to any surgical interference unless the benefits are considerably in excess of the risks of an exacerbation of the mental disease.

**Local Anesthesia in Anterior Colpohysterotomy.**—H. Tahler (*Zent. f. Gyn.*, June 15, 1912) reports the results of this procedure in Schauta's Clinic at Vienna, as employed in emptying the pregnant uterus. The question of combining the anesthetic with suprarenal preparations was also studied. The injected fluid consisted of 100 c.c. of warm, sterile, half per cent. novocain solution with about twenty drops of Suprarenin (Höchst). Ten cubic centimeters of the mixture are injected under the mucous membrane of the anterior fornix at the point where the incision is to be made. The paracervical tissue on either side is then injected, and in about five minutes afterward the operation begun. The separation of the bladder is readily accomplished and after the anterior lip of the cervix down to the internal os is incised, 10 c.c. of the mixture are injected into the anterior uterine wall at the angle of the wound. The uterus is then cleared out and the incisions closed by suture in the usual manner. If the fetus is of larger size, the extraction is done with perforation of the after-coming head. The previous injection into the bladder of hypnotics or anesthetics is not necessary. The operation was successfully done in nine cases of pregnancy varying from two to three and one-half months, which were complicated by a florid phthisis, or a heart with broken compensation. Less than 50 c.c. of the solution were needed in these cases and no after-effects observed. The recovery was without complications. The writer believes that the beginning of the fifth month constitutes the limit of pregnancy in which the method is justifiable.

**Complete Absence of the Vagina.**—Fordyce (*Edinb. Med. Jr.*, August, 1912) describes the case of a poorly developed girl of nineteen, admitted to the hospital, with severe pain in the lower part of the abdomen, which had recurred at regular monthly intervals for the previous year. She had never menstruated, and examination showed a complete absence of the vagina. An artificial opening was made by dissecting the tissue between the



rectum and the urethra. The resulting canal was packed with gauze around a glass drain. Four weeks later the recurrence of the severe pain prompted the opening of the abdomen, and the peritoneal cavity was found to contain a considerable quantity of dark fluid blood. The uterus was normal and blood was found to come from the right Fallopian tube. It being impossible to establish any communication between the uterus and the outside, a double oöphorectomy was done, with the hope of stopping menstruation, but notwithstanding this, all her symptoms reappeared the following month. Another laparotomy being deemed necessary, the uterus was found to be distended about the size of a two and one-half months' pregnancy. Amputation was done and the uterine cavity was found filled with fluid blood. This was evidently a case in which the abdominal pain and tenderness were symptoms of intraperitoneal bleeding from extrusion of menstrual blood through the Fallopian tube. The patient remained well after the complete hysterectomy.

**Fatal Poisoning Following the Intraperitoneal Use of Camphor.**—Rübsamen (*Zent. f. Gyn.*, August 3, 1912) employed a 10 per cent. solution of camphor in oil as an intraperitoneal prophylactic injection against peritonitis, in a laparotomy for an intraligamentous cyst combined with the total extirpation of the uterus. One hundred and seventy cubic centimeters of the officinal camphor oil were left in the abdominal cavity. The patient died two days later, with evidences of a severe general poisoning, having complained of severe headaches and finally becoming delirious, with suicidal tendencies. The autopsy showed no evidences of any septic infection, but a progressive necrosis of the urinary tubules was evident, due probably to the excretion of the insufficiently oxidized and toxic camphor. The writer believes that if camphor is employed for this purpose, a solution not greater than 1 per cent. in strength should be used, for then the lethal dose of the drug will not be exceeded.

**Coagulation Time and Ovarian Function.**—Keller (*Archiv f. Gyn.*, Bd. xcvii, H. 3) after discussing the various methods for testing this phenomenon believes that the one advocated by Bürker is the most suitable for the purpose and he has applied the same in a series of 250 gynecological cases in Fehling's Clinic at Strassburg. He studied particularly the relation of the coagulation time to menstruation, to the menopause, and to castration. It was found that the coagulation time in women is almost constant and averages 4.65 minutes. There is no change in healthy women or women with pelvic disease, nor before or after menstruation. The menopause does not seem to have any effect on this phenomenon at any time. Castration does not influence the coagulation time of the blood either directly after operation or a prolonged interval. In healthy women no change occurs, either in pregnancy or during the puerperium.



# DEPARTMENT OF PEDIATRICS.

## ORIGINAL COMMUNICATIONS.

### MATERNAL FEEDING.\*

BY

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MATERNAL feeding should be the keystone of the propaganda for the prevention of infant mortality. It does not take a great deal of study to convince one that we fall far short of the attainable in our practice. Fortunately the confusion of ideas is not so bad concerning breast feedings as Keller has shown it to be about artificial feeding.

Can the number of mothers who are able to nurse their infants be increased? The very interesting study of 1501 clinic cases reported to this organization by Dr. Herman Schwarz at Baltimore showed that, with careful instruction of the mothers, 96 per cent. of the babies were able to take the breast for one month or less, that 88 per cent. were on the breast for three months and 77 per cent. for six months. Out of 1500 women six were reported who could not nurse on account of inverted nipples and four who seemed to have no milk at all. Jacobi's long experience has led him to conclude, as expressed in his presidential address before the American Medical Association last June, that: "There is no such thing as absolute absence of milk secretion," and again: "The attentive doctor and the diligent midwife know that our women, poor and rich, suffer from no organic mammary degeneration."

If the possible degree of attainment is so high, what are we actually accomplishing? To get some statistics upon this subject I sent out the following list of questions to physicians concerning the results obtained in the families of our own profession:

\* Read at the Third Annual Meeting of The American Association for the Study and Prevention of Infant Mortality, at Cleveland, October 4, 1912.

1. How many children have you had?
2. Give years of births. First child \_\_\_\_\_. Second \_\_\_\_\_, Third \_\_\_\_\_, Fourth \_\_\_\_\_.
3. How many are living?
4. If you have lost children, at what ages, and from what causes?
5. How long was each infant at the breast wholly? (If but a few days, or a short time, state as nearly as possible how many days.) First child \_\_\_\_\_months. Second \_\_\_\_\_months. Third \_\_\_\_\_months.
6. What intervals were allowed between feedings?
7. At what time was the breast discontinued? First \_\_\_\_\_months. Second \_\_\_\_\_months. Third \_\_\_\_\_months.
8. Give the reason for discontinuing the breast feeding in each case, if before the ninth month.
9. If the bottle was given with the breast, was it in addition to each breast feeding or in place of certain breast feedings?
10. If mixed feeding was used, state when the bottle was begun.

But two physicians who answered indicated that they had not striven to procure for their own children the advantage of breast feeding. As delayed answers are still coming in, and as a limited number of figures, only, can be followed when read, I shall give only the most essential results here, and defer the rest until they can be shown in complete tabulation.

From the physicians of Minnesota I received 892 answers. After deducting those who were unmarried and those who were married but have no children there were left 469 mothers for this study. Of these: two or 0.4 per cent. intentionally did not nurse their children; seventy-five or 16.0 per cent. did not nurse one or more children two months; seven or 1.5 per cent. nursed one or more children two months but failed before three months. Forty-two or 9.0 per cent. nursed from three to six months only; forty-eight or 10.2 per cent. nursed six, seven, or eight months; 295 or 62.9 per cent. nursed nine months or over. Total, 100 per cent.

Similar results were obtained from the states of North and South Dakota, Montana and Northern Iowa. Seventy-six per cent. of the wives of the physicians answering from Wisconsin were, however, able to nurse their babies nine months or more.

These same questions were also sent to the physicians who registered for the Section on the Diseases of Children at the

Atlantic City, St. Louis and Los Angeles meetings. It was hoped by this means to get answers which would not be open to the objection of coming from one part of the country. One hundred and seventy-one answers were received. Thirty-nine of these physicians were not married and after deducting those who were married but childless, ninety-four were left from which to draw conclusions. Of these:

1. The wives of none had intentionally withheld the breast.
2. Nineteen mothers or 20.2 per cent. had not been able to nurse one or more children two months.
3. One mother or 1.0 per cent. failed during the third month.
4. Twelve mothers or 12.8 per cent. nursed three, four, or five months.
5. Fifteen mothers or 16.0 per cent. nursed six, seven, or eight months.
6. Forty-seven mothers or 50.0 per cent. nursed nine months or longer. Total, 100 per cent.

If these be divided into those who failed before the end of the third month, and those who carried on the nursing longer, we get the following results:

For Minnesota:

Failed before the end of the third	
month .....	17.9 per cent.
Succeeded longer than three months ..	82.1 per cent.
	<hr/>
	100.0 per cent.

For those registering for the Section on Diseases of Children:

Failed before the end of the third	
month .....	21.2 per cent.
Succeeded longer than three months ..	78.8 per cent.
	<hr/>
	100.0 per cent.

From the above it is probably safe to conclude that about 80 per cent. of the wives of American physicians succeed in nursing one or more children three months or longer.

Rietschel found from the answers of 110 German pediatricists that but 60 per cent. of their wives had succeeded in nursing longer than three months.

When we compare these actual results with those accomplished by Schwarz and with the possibility as set by Jacobi we see that, although undoubtedly much better than the results



among the families of laymen, they are far from satisfactory. We are forced to the conclusion that the number of mothers who nurse their infants can be increased.

By what means can the breast nursing be increased? This is naturally considered in two parts, first the technic of breast feeding and second the means of getting this technic employed.

Breast feeding may not succeed because the mother herself is not properly considered. She must of course have the advantage of good nourishment and care during the whole of her pregnancy. She should have the assurance that almost every mother can nurse her child. She must be made to understand the importance of maternal feeding for her babe's life and growth. She must be given facts to neutralize the effect of stories told by well-meaning but ignorant busy bodies. Shortly after the child is born she will receive circulars, very shrewdly worded, which laud the ease and safety of substitute feeding. The danger of such ideas, and interestedness of those supplying them must be made clear to her.

Nursing must be made as little a burden to the mother as possible. We have all seen mothers who have been directed not to eat vegetables or meat, sour things or sweet things, and so on until they ask, with justice: "What is there left for me to eat?" Many a breast nursing has gone to wreck because the mother's appetite rebelled against a diet made up almost exclusively of gruels, cocoa and beer. We now know that the nursing mother can eat what is proper for any woman, with an increase of food value, and reasonable addition of fluids to cover the loss through the milk. The knowledge that pickles do not sour the milk will give many mothers an entirely new view of the subject. After such information it should be explained to her, of course, that no one advises a diet largely made up of pickles for any woman.

The mother's comfort should be considered. By lengthening the interval of feeding the mother is greatly relieved. Very rarely is an interval less than three hours necessary and more often a four hour interval is best employed. We frequently hear that the baby stays at the breast from one-half to one hour and even all night. This is very trying to the mother and of no real service. Often the only way to convince the mother of this is to determine the amount taken in fifteen or twenty minutes by weighing the baby before and after nursing, and then, by putting the infant back for five minutes and weighing again, she can be shown that very little, if any, milk is obtained by the baby in the

last five minutes. Prolonged nursing is a common cause of fissured nipples. With the longer intervals it may be necessary to give both breasts at one feeding. Longer intervals and shorter nursings will often change an unsuccessful and burdensome lactation into a real pleasure.

Night feedings should be avoided as much as possible. Frequently, what appears to be a necessity is only a habit and two or three nights' training will give rest for both mother and babe in the future. Menstruation, even if the baby is temporarily restless, is no reason for taking the child from the breast. Pregnancy is not an indication for immediate weaning.

Contagious diseases such as scarlet fever and diphtheria, and even the usual typhoid, I am speaking from personal experience, as well as from reports of others, are not sufficient ground for weaning the young baby. There may not be enough milk for a time, and the temporary addition of some artificial mixture may be necessary, or even during a severe fastigium, it may be advisable to take the baby from the breast for a short time altogether, but with the convalescence, the reapplication of the baby to the breast will bring the milk back and the lactation will proceed normally. Open tuberculosis is a contraindication to breast feeding.

The fundamental requirement for the stimulation and continuation of the milk flow is the complete and regularly repeated evacuation of the breasts. Specific preparations for the production of the flow of milk are of value principally because of their mental effect. The sucking of a strong healthy baby stimulates the breasts to increased output. It has been recently shown that the milk supply can also be kept up by diligent artificial evacuation of the breasts, by the pump or hand. If the mother's own babe is weak, the strong child of another woman may be put to the breast to stimulate the milk flow.

From the baby's standpoint, as well as from the mother's, it is well not to nurse it at less than three hour intervals. A large number of babies do well on three and a half or four hour intervals. The infant's stomach, as well as that of adults, should be allowed a period of rest. Most of the so-called "colic" will disappear with longer intervals. Likewise it is best, for the babe, not to let it lie at one breast too long. Fifteen or twenty minutes are almost always enough. After that length of time the child gets little or nothing.

If but one breast is taken at a feeding, they should, of course,

be offered alternately. If both are required each time, the nursing should be begun at one for the first feeding, and at the other for the next feeding, and so on alternately.

The nipples may be cleansed with boiled water; antiseptics are not necessary and may be harmful. The mouth of a normal baby should not be washed, as this practice is often the means of implanting thrush, or other infection, and the mechanical injury may cause Bednar's Aphthæ or simple stomatitis. Cracked nipples should receive care and protection preferably by nipple shields, as by furnishing an opening for infection they may be the cause of inflammation of the breast proper.

If the baby does not gain in weight, it is rarely, if ever, because the "breast milk does not agree with it," but usually because the quantity of milk is insufficient. When the baby is taken from the breast because the milk is supposed to be poor in quality, it is a mistake in nearly every case. Poor milk cannot be recognized by looking at a few drops or a glassful expressed from the breast. The rough method of milk analysis by hydrometer and creamometer has been the cause of many deaths through depriving babies of breast milk on the ground of incorrect determinations of the contents. Accurate analyses by competent chemists are of little clinical value as the variations shown from the normal are so slight that they do not, in the present state of our knowledge, warrant weaning.

If the infant is well otherwise, but still does not gain at the breast, it is not because the "Mother's milk does not agree with the baby," but because it does not get enough. This can be determined by weighing the baby before and after each feeding for twenty-four hours. If the amount is found to be insufficient, regularly repeated complete evacuation of the breasts, patiently persisted in, will usually bring the amount up. The mother's health and nourishment should, of course, be looked into. If the quantity is found to be definitely deficient, sufficient additional or complementary feeding may be given after each nursing to nourish the child properly, all through the lactation, or until the breast can supply enough. The fact must not be lost sight of, however, that the repeated, complete evacuation is the essential. The mother is often led to believe that she has not enough for five or six nursings, and drops one breast feeding, putting in its place, a bottle feeding, hoping to have more for the nursing that she does give. This does seem to be the case at first, but the



breast soon adjusts itself and there is really less milk as she has transgressed the law of repeated, complete evacuation.

There is general agreement that weaning should be begun in the last quarter of the first year, and carried out gradually. First one breast nursing should be supplanted by an artificial feeding and when the breasts have adjusted themselves, a second nursing should be dropped, and so on until all are given up. This should require three weeks or longer.

What are the difficulties practically experienced in carrying out the technic of nursing? Among the questions sent out to the physicians by me, was one asking the reason for discontinuing the breast feeding in each case, if done before the end of the ninth month. We have here the means of studying, not one man's experience, but that of many in the field. Let us consider the various causes of failure as to the number of times they occur, their justness and remedy.

Insufficient quantity, as one would expect, is most frequently put down as the reason for discontinuing the breast feeding. This is given for the reason with 228 babies of the Minnesota list and forty-eight times in the answers from the list of the members of the Pediatric Section of the American Medical Association. Insufficient quantity is in most cases an indication for mixed feeding, that is, a complemental feeding with the breast, not replacing the breast, a supplemental feeding. Undoubtedly this number would not be so large if it were confined to those of the past decade, as Prof. Schlossmann stated in the discussion of Rietschel's figures. Schlossmann confessed that in the case of his own family he was confident that, had the lactations fallen in the last decade, the result would have been better for the breast feedings. Included with the reason of "insufficient quantity" should probably be the answer: "No milk," fifty-four times for the Minnesota list and eleven times for the American Medical Association list. It is generally considered, to-day, that there is no such condition as complete agalactia. "No gain in weight," which appears for twenty-five babies, should probably appear with insufficient quantity as an indication for mixed feeding, rather than weaning.

In the larger list the "mother's condition" was given as a reason for discontinuing, ninety times for forty-six mothers and nineteen times for thirteen mothers in the shorter list. Little competent criticism can be made of this reason, except that it appears much oftener than in Schwarzs' series and one suspects



that in some of the cases the babe's right to the breast milk and the dangers of artificial feeding, were not given sufficient consideration in the decision.

In the light of the modern understanding, the next reason "Poor quality of the milk," which appears eighty-three times in the Minnesota list and thirteen times in the A. M. A. list would, with rare exceptions, be considered as no reason, but simply a misinterpretation of some illness of the baby or trouble caused by some error in the technic of breast feeding.

"Colic," which is given as a reason five times, does not appear in the list of the babes that were fed with an interval every three hours.

Menstruation appears as a reason but five times, which is probably five times too often.

Mastitis appears but eight times and troubles with the nipples four times. This shows how rarely it is that this, at times, adequate reason for giving up the breast feeding, cannot be overcome. Other scattering reasons are given, but none of importance for the matter in hand.

The justification for taking your time with the above will, I hope, become apparent when we come to consider what is to be done to increase the number of successful lactations.

Those whom we must reach may be divided, as Southworth suggests, into

- "1. Ultra social group.
- "2. The educated classes of means, large or small.
- "3. The great middle classes, including well-paid artisans
- "4. The very poor and ignorant, including the foreign immigrants."

How can we get information concerning the importance and technic of breast feeding before these various groups?

Group one can undoubtedly be reached best through their medical advisers.

This is undoubtedly also true of the educated group two. Even the students of sociology and social workers, editors, clergy, philanthropists and nurses, who are doing such valiant work for the prevention of infant mortality, as well as the midwives, must draw their information upon this technical subject, from the medical profession.

Class three, the bulk of the population, must be reached through their medical attendants and others of class two.

And finally, class four must depend upon the activities of class two, with the inclusion of the midwives.

It comes right back to the medical profession. It is not possible that every physician should be an expert rhinologist, dermatologist, surgeon or even pediatricist, but it is practicable and highly advisable that every young physician who goes out from a medical college shall have proper instruction concerning the importance and simple technic of the establishment and maintenance of lactation. It is also possible to put the practical essence of the advance made during the past decade in the knowledge of the function of lactation in the hands of every physician in the country. As a preliminary step, leading toward uniformity of instructions to mothers, a concerted effort should be made by the various branches of this organization, to put the official pamphlet now being prepared by our committee, into the hands of every physician in the various localities.

Dr. Jacobi's advice concerning the instruction of midwives is excellent and if carried out will accomplish much. Every midwife should have a copy of the booklet also.

The consultations and dispensaries allied with this organization are doing fine and ever increasing work in getting information concerning breast feeding, not only to Southworth's fourth class, but also before all the other groups.

The newspapers can, and some now do, through "Babies' Friend" departments, give great aid in distributing knowledge about breast feeding. Such departments may, however, do definite harm if not carried on under the direction, or with the advice of competent pediatricists. I can conceive of no editor, before whom this need is properly put, who would not feel in sympathy with the movement.

Clergymen can, and undoubtedly will, if properly approached, insist upon the mother's first duty.

Much can be done, and a start has already been made through Dr. Putnam's committee, in getting such instruction into the schools.

Premiums for nursing mothers and allied means are not practicable in this country. The keynote is dissemination of information concerning the importance, possibility and technic of breast feeding. Let us unite upon this platform.

## A STUDY OF OPHTHALMIA IN THE NEW-BORN.\*

BY

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Professor of Obstetrics, Woman's Medical College of Philadelphia  
Philadelphia.

(With Nine Charts.)

ON seeing the title of this paper one might well wonder how anyone should have the hardihood to think of serving up again a subject in which for most people the first and last words are summed up in the Credé treatment, now some thirty years old. I shall, however, do my best to justify my choice of a subject.

Strictly speaking ophthalmia neonatorum is an acute conjunctivitis which appears in the new-born and may be due to a variety of organisms or even to irritation without organisms, as in the so-called silver catarrh. Practically it means but one thing to us all—inflammation of the conjunctiva caused by the gonococcus, and characterized by swelling of the lids, a discharge of pus from the eyes and chemosis, which may go on to the formation of corneal ulcers and even to total blindness, if not controlled in time.

The present study of ophthalmia neonatorum is based on a series of thirty-seven cases, occurring in 3225 births in the service of the Maternity of the Woman's Medical College of Pennsylvania (a service including both Hospital and Out-practice Departments).

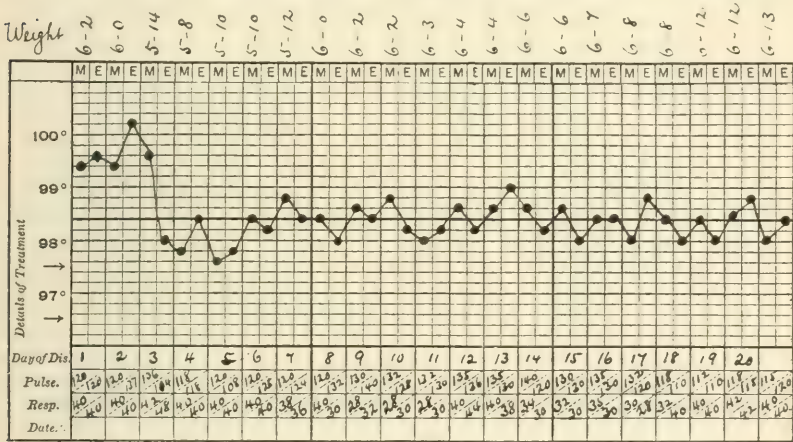
From this number I shall at once cut out six out-practice cases, four evidently due to silver reaction and two of such mild character (yielding to simple boric flushing) and such short duration (two or three days) that only the overconscientiousness of a student would have recorded them. This leaves us then thirty-one cases, from which to draw conclusions—a small number, yet enough to yield results if studied carefully.

Ophthalmia is usually classified as: Antepartum or intrauterine: cases developing before birth. Primary: The infection received at birth, the disease developing the first to the fifth day inclusive. Secondary: The disease appears after the fifth day and is therefore not a birth infection, but has been acquired later from the mother or from another source.

Of these the antepartum variety is so much the least frequent that those who see cases usually hasten into print with their

\* Read before the Philadelphia Pediatric Society, March 12, 1912.

observations. It is true that it is rare for a child to be born with an advanced case of ophthalmia, with corneal ulcers for example—yet Friedenwald as long ago as 1895 collected notes on twenty cases including one his own, while Holzbach in 1908 cited a number of others. Only recently Dorland has reported a case of advanced intrauterine infection. Sydney Stephenson includes also under this heading cases in which the baby develops the disease within a few hours of birth, thus widening the limit considerably. It is usual to assign as the cause of antepartum infection rupture of membranes long before birth, but Stephenson



Gonorrheal Ophthalmia developing on third day.

could explain only twenty-six of seventy-one cases in this way, and when we consider that babies born in the membranes have had the disease already present, we must believe that the infection can pass into the amniotic sac.

In my series there were three true antepartum cases with inflammation present at birth and three more which would be claimed by Stephenson, because the disease appeared within a few hours. In only one was there a history of early rupture of membranes and that only six hours before the birth of the child.

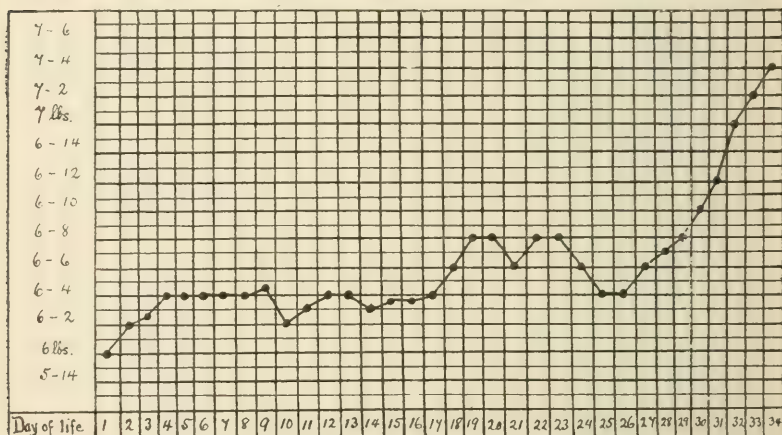
	Hospital	Out-practice	Total	Per cent.
Antepartum.....	3	0	3	9.67
Primary.....	10	3	13	41.93
Secondary.....	14	1	15	48.38
	27	4	31	

I shall have occasion later to refer again to the large proportion of secondary cases.

As already stated, ophthalmia may be caused by various



organisms besides the gonococcus, the pneumococcus giving 5 to 15 per cent. of the cases, according to different figures quoted by Dimmer. The proportion of gonococcic infection is variously given as from 41 to 72 per cent. Probably 60 per cent. is a fair estimate. In our series the proportion differs according as we accept clinical or laboratory findings. In this connection, I might say that the out-practice of our Maternity covers a large part of the southeastern quarter of the city, and that the Hospital itself receives many unmarried women and others in most destitute and often diseased condition. We have no illusions on the subject of venereal disease, and we run absolutely counter to



Weight chart. Baby E. Ophthalmia, Eleventh day. Moderate effect on weight. the common law in believing every case guilty until—and often after—it is proved innocent. We feed gray powder to our babies on the slightest provocation and with good result. In like manner we consider every case of conjunctivitis a gonococcus infection and so treat it, while we are waiting for the laboratory report; if that comes back negative, we usually continue the treatment openly and the diagnosis in our hearts. These are the findings in our thirty-one cases.

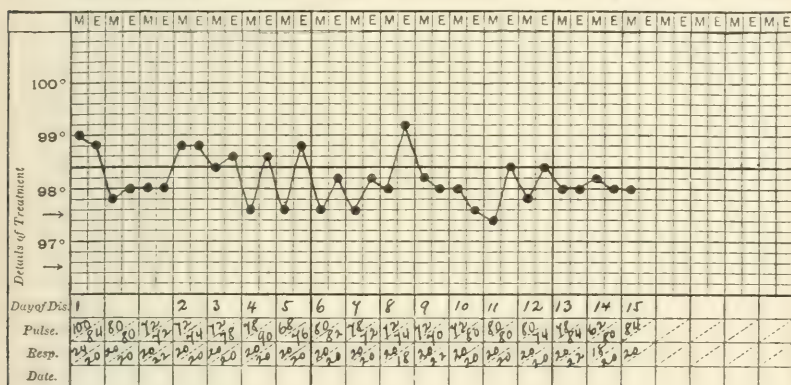
	Clinical diagnosis	Bacteriological diagnosis
Positive.....	25	14
Doubtful.....	5	3
Negative.....	1	9
No record.....	—	5
	31	31

The proportion of gonorrheal cases thus varies between 45.16 per cent. and 80.64 per cent.

In behalf of the clinicians it may be added that in five of the nine cases negative according to the microscope the duration of the infection was at least two weeks—a long time for a non-gonorrheal condition; in one the disease was present at birth; the other three were doubtful clinically.

It has been stated that male children are more often affected by this disease. Our proportion of sixteen males and fifteen females hardly bears out this contention, when we realize that more male children are born.

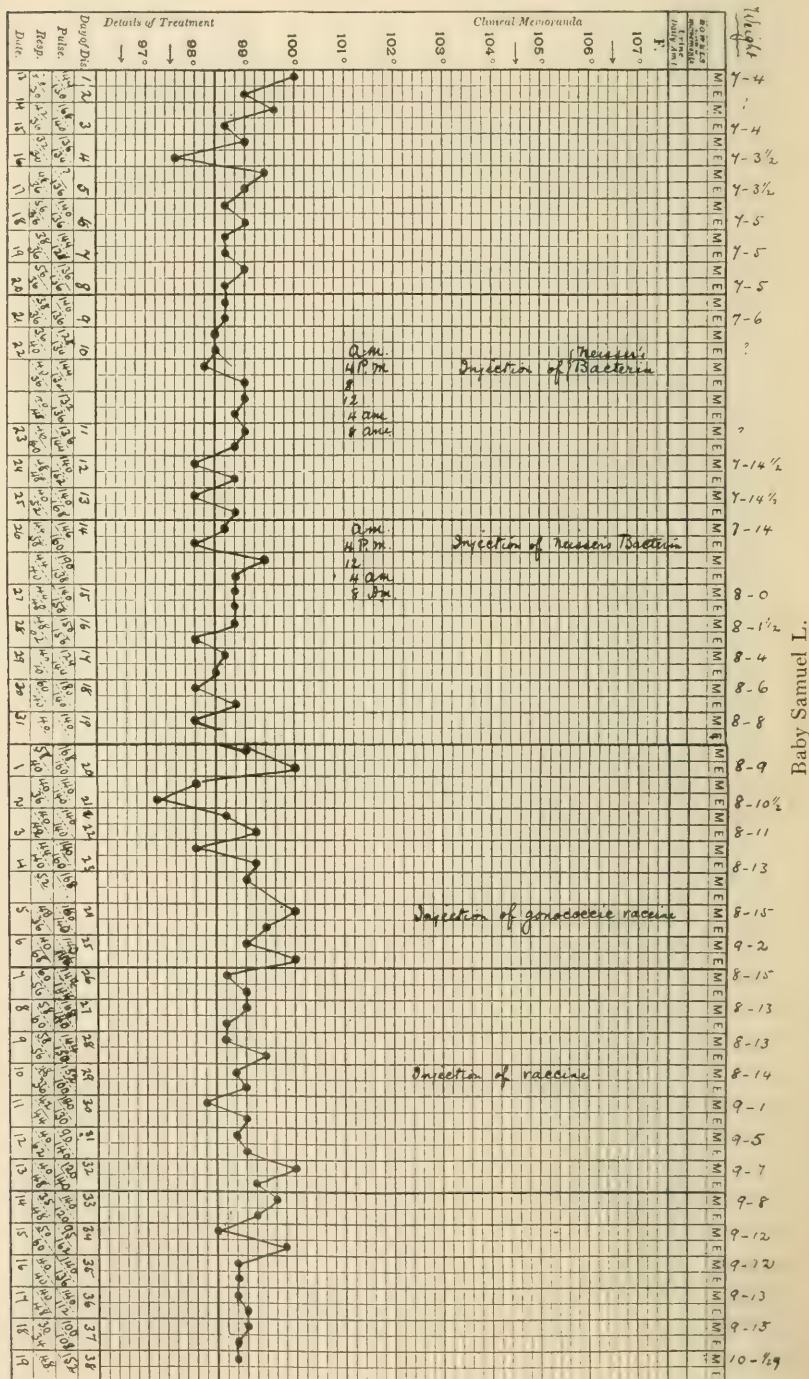
It would seem reasonable to suppose that the severity of the symptoms of the disease in the mother would bear some relation to the virulence of the infection in the child. In point of fact twenty-one of the women passed through the puerperium without



Gonorrhea. No constitutional disturbance. Child's eyes infected on eighth day.

the slightest systemic disturbance, even though the smear from the cervix, vagina or urethra was positive; and three had but a slight reaction, the temperature running a few times over 100°. Only seven showed the variations of temperature with abdominal or ovarian pain, characteristic of a gonococcus infection in the puerperium. The three worst cases in our series were contracted from mothers who showed at most but a mild reaction. On the other hand the most severe conditions have been encountered in the mother without a sign of infection in the child.

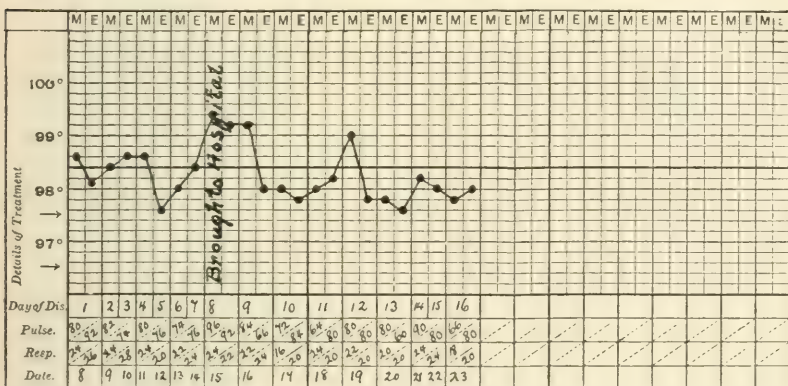
It might also be expected that the general condition of the child would suffer from the effects of such an infection, and the statement is made that constitutional disturbance, fever and loss of weight, may accompany it. Von Holzbach, quoting Mayer, goes even so far as to say, that the children of gonorrheal mothers are mostly poorly developed and show little resistance.





and adds that the bad state of nutrition reacts unfavorably upon the eye condition, forming a vicious circle (what Mayer actually says is, "es fällt auf"—it is striking—that four out of six children were poorly developed at birth and the two others, normal at birth, did badly).

Of our thirty-one babies, twenty-six presented a normal temperature throughout, one had variations to  $100^{\circ}$ , four had a marked rise of temperature. Two of these were probably cases of "starvation temperature," one was apparently syphilitic, and the fourth had fever only during an attack of bronchitis which developed on the eleventh day. In other words there was in no case any marked change in temperature which could be attributed to the infection in the eyes.



Lena L. Normal purpura. This woman's child was our worst case of ophthalmia.

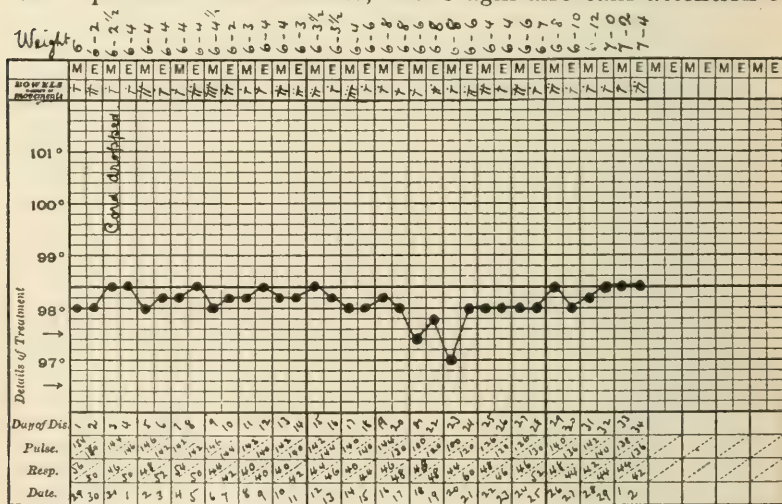
The average birth weight of thirty babies (omitting the one case which was negative according to both clinical and laboratory findings) was about  $7 \frac{1}{3}$  pounds, which may fairly be considered as an index of average development. In studying the effect of the disease on the child's weight we must leave out six cases in which the charts were not available, although it might be stated that four of these babies were discharged "in excellent general condition." Of the remaining twenty-four, fourteen gained well and two slowly throughout their illness, including two who were artificially fed, five lost for a time but were gaining well when discharged, and only three lost steadily.

The practical point to be gleaned from this study of the general condition of the child is that there is no reason to separate the child from the mother, even if she be diseased, since her milk is not affected and the babies do much better if breast fed. Only



if the mother is particularly ignorant or uncleanly, will it be wise to take the baby from her to avoid the chance of continual reinfection as was finally necessary in one of our cases. The mother of this child was so deficient mentally that it was impossible to reason with her or control her actions, and there seemed to be no hope of a cure for the baby as long as she was with it.

The present methods of prophylactic treatment for ophthalmia are direct descendants of the method which Credé introduced in 1882. His original 2 per cent. solution of silver nitrate proved to be too irritating (Gewin in a recent article reports about 6 1/4 per cent. of cases of "silver catarrh" following the use of 1 1/2 and 2 per cent. silver nitrate, and Cragin also calls attention to



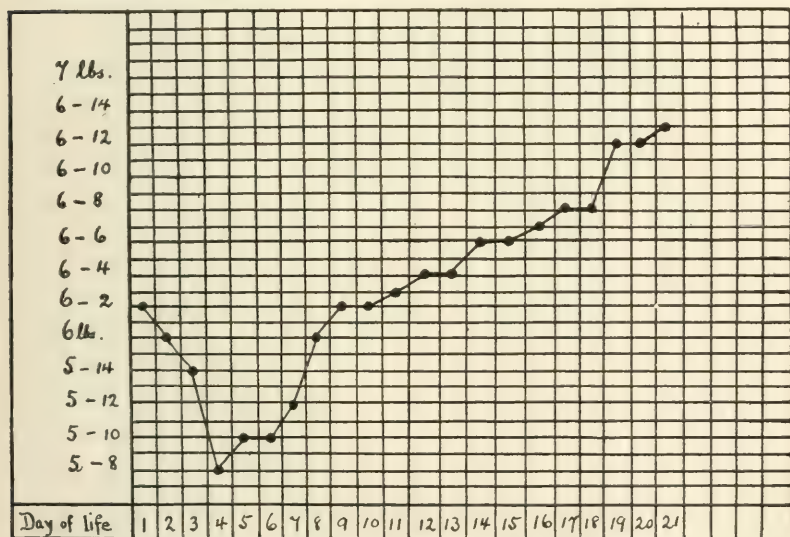
.026 per cent. He drops the solution on the closed lids, in order to saturate the lashes and the edges of the lids, where gonococci are likely to lurk.

The results of prophylactic treatment as seen in our out-practice are as follows (although our work corresponds in many ways to general practice, it seems fair to say that we might expect less favorable results on account of unsanitary living conditions, overcrowding and the like). In a series of 2275 cases we found

Marked silver reaction.....	4
Slight reaction.....	2
Conjunctivitis (not gonorrheal clinically or microscopically)	4
Gonococcus infection clinically (negative microscopically)	2
Gonococcus infection, both clinically and microscopically)	2

Total..... 14 or 0.61 per cent.

Omitting the first cases of silver reaction, there remain eight

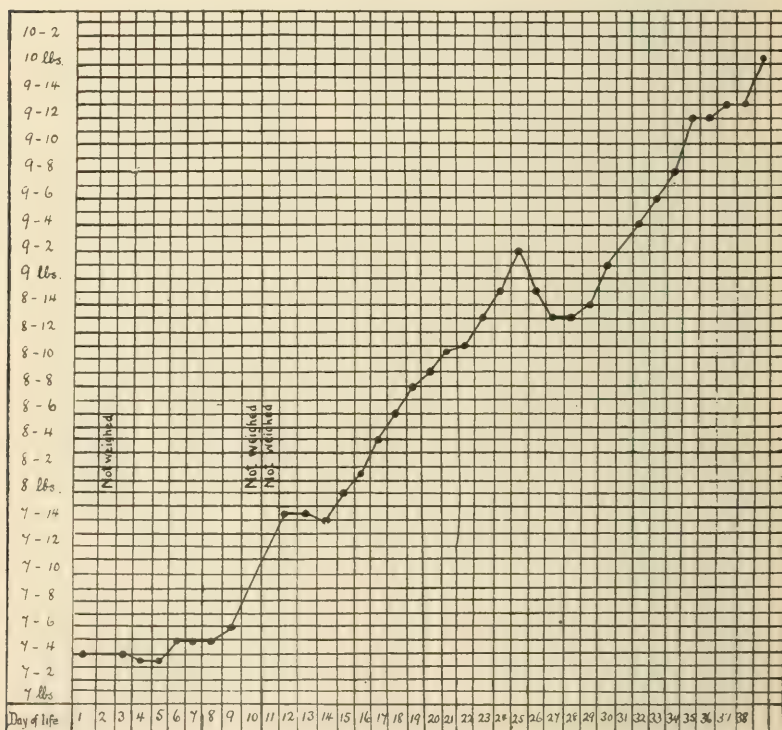


Weight chart. Baby B. Ophthalmia developed third day.

cases of ophthalmia (0.35 per cent. of which at most four (0.175 per cent. were gonococcus infections).

Quite other results obtain in the service of the hospital, where in 950 cases, ophthalmia occurred twenty-seven times (2.84 per cent.). Such a percentage would have been most discouraging, had I not found that Cragin, when using 1 per cent. silver nitrate at the Sloane Maternity, had thirty-four cases per 1000 (3.4 per cent.). With 20 per cent. argyrol his proportion was 21 per 1000. But it is just here that I wish to refer back to the classification of our cases, since it has a distinct bearing on this point of the value

of prophylaxis. It stands to reason that no silver solution on earth can be expected to prevent an inflammatory condition which is present at the birth of the child as in three of our cases. Moreover, it cannot be expected that the effect of treatment at birth will last forever and it is generally admitted that if a case of ophthalmia develops after the fifth day the infection has been acquired after birth, and so can hardly be considered to reflect on the method of prophylaxis. We thus find that 1 per cent. silver nitrate failed to protect in ten cases eight if we accept

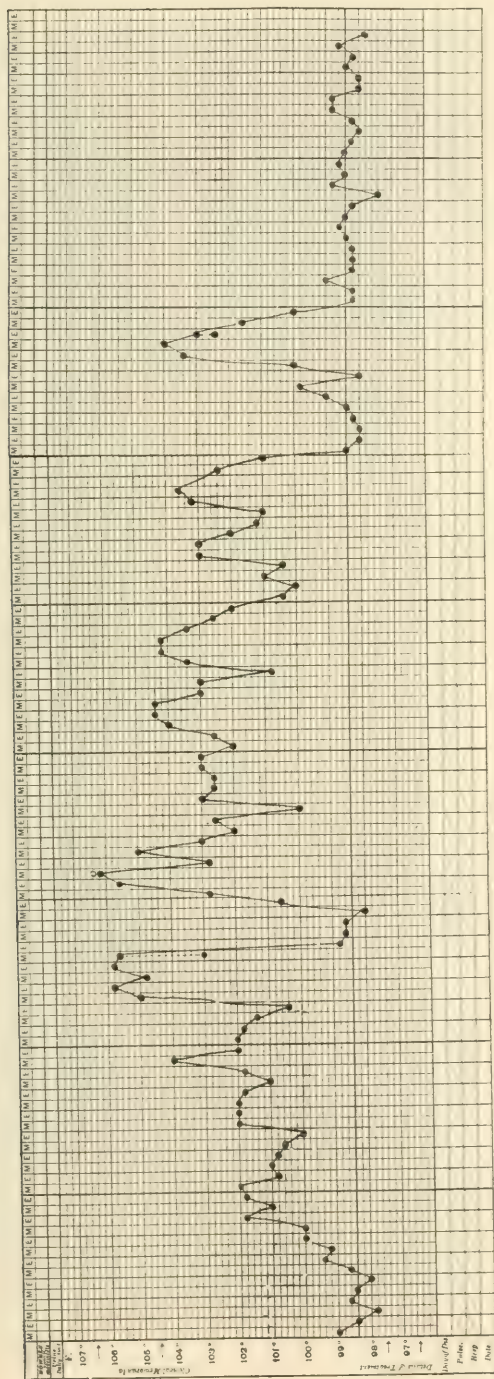


Weight chart. Baby L. Our worst case of Ophthalmia. No effect on weight.

Stephenson's classification) out of 950 births or 10.5 per 1000—and I think we shall try it awhile longer, particularly in view of the excellent results in the out-practice.

The secondary cases should not be thus lightly brushed aside, however, and regarded as of secondary importance as well. Their frequent occurrence in our series is a point which has struck me so forcibly that I am grateful to the Pediatric Society for





Puerperium; gonorrheal infection; peritonitis; child's eyes was effected.

causing me to write this paper and so discover it. It is true that they are not the result of inefficient prophylaxis at birth, but for all that, I feel that they ought not to and need not occur, and I mean promptly to take steps for their prevention. Certainly their number could be greatly diminished by the repetition of some prophylactic treatment at intervals of two or three days through the puerperium, when gonorrhea is suspected in the mother. It will probably be better to use argyrol than silver nitrate on account of its less irritating character.

I also feel that these secondary cases must be responsible for a certain per cent. of the blindness dating from infancy, and for that reason would recommend most careful inspection of the baby's eyes throughout the puerperium, even though prophylactic measures have been taken at birth. It is clear from the records of blind asylums in this country that the proportion of their inmates whose affliction is attributed to ophthalmia neonatorum is not falling off to any extent. This means that the necessity of prophylaxis at birth should be vigorously pushed on all sides. It has been customary to put the blame serenely upon the ignorant midwives and demand regulation of their practice, but we must also recognize that physicians are to blame as well—in from 29 per cent. to 70 per cent. in different series—and urge them to practice more thoroughly what they preach. Much will also be gained when this disease is reportable, since secondary as well as primary cases will then receive attention which they deserve.

The treatment in these cases I shall not detail, nor shall I make any comparisons of the methods used by the various ophthalmologists who have directed the management of our more severe cases. We have depended for the most part on argyrol, supplemented at need by silver nitrate, boric flushings, hot and cold compresses for the swollen lids, and atropine for dilatation of the pupil. Vaccine was used in the last case. Whatever the treatment the results have been uniformly good, except in the case of one child who died from uncontrollable hemorrhage from the entire conjunctiva of both eyes—perhaps a case of hemorrhagic disease of the new-born.

In conclusion my thanks are due to those ophthalmologists who have contributed so largely to our satisfactory results, as well as to all those whose carefully kept records have made this paper possible.

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## THE CARE OF THE NOSE AND THROAT IN CHILDREN.

BY

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THE commonest portal of entry of infection naturally is the mouth, the nose deserves second place, and if it were not for the vast amount of lymphatic tissue contained within Waldeyer's ring, numerous bacteria of menace to the little patient would find their way into the intestinal canal, lungs and circulation. We have evident proof, for example, of the vast amount of work performed by the tonsils, for on microscopic examination numerous bacteria can often be seen in the parenchyma, and experiments with various chemicals have also shown that there is a definite connection between these two organs and the lymphatic structures of the neck. In infancy and early childhood enlargement of the upper cervical glands is not an uncommon occurrence. This is due for the most part either to teething with its inflammatory accompaniment or to the attempt on the part of nature to destroy bacteria which otherwise might cause a great deal of harm.

At this day the question of tonsil enucleation is occupying a large space in the literature and it is often a question whether or not it is advisable to remove tonsils. In a former paper (*New York Medical Journal*, July 13, 1912), I remarked: "I believe that the tonsils are of a great deal of value in early infancy and childhood, but that as a result of the vast amount of work which they perform during the first few years of life, they eventually become in most instances a menace and a source of danger." I work upon the principle that no tonsils are of so little value during the first two years that they should be removed unless they cause definite symptoms, directly or reflexly, such as



impairment of breathing, frequent attacks of tonsillitis or a tendency toward a suppuration of the glands of the neck. Many children who are brought to the specialist for nasal obstruction suffer from a very slight hypertrophy of the tonsils and a great deal of adenoid tissue in the nasopharynx.

It is impossible in these cases to say whether the adenoids are the sole cause of the obstruction or whether the tonsils by their enlargement backward into the nasopharynx also contribute toward the stenosis. The nasopharynx in a child under two years of age will just about admit the tip of the little finger. And tonsils the size of hazel-nuts or possibly of peanuts may be large enough to cause as much trouble as the adenoid tissue which is lodged behind the palate. The relation between the size of the tonsils and the individual throat is of far more importance than the size of the tonsil taken by itself.

Whether the tonsils exercise some individual function such as the secretion of an internal product which may be likened to the thyroid secretion is questionable. Yet during the first two years it is better to assume that such is the fact. Adenoids are not supposed to contain any internal secretion, yet it has been definitely established that there is a direct relationship between the thyroid gland and adenoids and in some instances when the thyroid gland is lacking and the adenoids have been removed symptoms of cretinism have been observed. Conversely, it has been stated by some English authorities that the administration of thyroid extract will often reduce the size of an adenoid and that it is a wise policy to administer small amounts of the extract of this gland in those cases in which the child's general physical condition does not improve after the removal of these vegetations.

If it is decided to remove the tonsils, enucleation is the only operation permissible. Tonsillotomy is not a surgical procedure and the after results of such an operation are often disastrous for it may be necessary to reoperate these children and when such an operation is done various difficulties are encountered which make the procedure anything but easy. I have come across numerous cases in which the tonsils had been previously removed once, twice and three times and in which it has then been necessary to do a tonsillectomy. Numerous adhesions had been formed between the anterior and posterior pillars and the segment of tonsil that remained and portions of the palate had become enmeshed in the adhesions and in some cases the

segment had become so adherent to the sides of the throat that it was impossible to do a thoroughly clean operation without a great deal of mutilation of the tissues. Yet in these cases it was necessary to do something and the end justified the means.

There is no question that removal of adenoids is necessary in children and this procedure is considered so simple that it is often performed by the most incompetent operators. The removal of adenoids is not a difficult procedure but one must know how to do the operation and one must perform it many times before he can be satisfied that all the tissue he seeks to remove is removed. Even with the utmost care the most competent operator cannot promise that the adenoids will not recur, for at the time of operation, on account of the great amount of bleeding and the inability to see the nasopharynx, one may have been unfortunate enough to leave a small piece of adenoid tissue which will grow again. In children over five years of age I have been able five or six days after the operation, in many instances, to get a clear view of the nasopharynx by means of my pharyngoscope and, therefore, I have often been able to assure myself that no tissue remained.

Although tonsils and adenoids are the two bugbears of infancy and childhood there are one or two other conditions which are of a great deal of importance. I might first mention the condition of high, arched palate with narrow nasal orifices, which is accountable for a great deal of mouth breathing in children. These cases belong more particularly to the orthodontist. They must be recognized however by the nose and throat surgeon. It makes no difference how much tissue is removed from the throat and nasopharynx if the nasal orifices are small, for until such a condition is corrected breathing will naturally take place through the mouth. It is marvelous to see the wonderful effect which the orthodontist can procure by the widening of the upper jaw. In those cases which I have referred to a competent orthodontist who has been able to spread the jaw from one-half to three-quarters of an inch, cases in which tonsils and adenoids have been thoroughly removed, and in which there was still a nasal obstruction, the nasal orifices became sufficiently enlarged to allow of proper breathing, and the result upon the child was as miraculous as if he had been a cretin to whom thyroid extract had been administered.

Suppuration of glands of the neck in definite relationship to the tonsils is not an uncommon condition in infancy and early child-

hood. It is often a question whether it is more advisable to get at the source of the condition and remove that or to remove the gland itself. It has been definitely proven by Wood of Philadelphia, and Beck of Chicago, that an infection of these so-called tonsillar glands takes place and in many cases the removal of the tonsil has caused a subsidence of the inflammatory suppurative condition of the gland. Beck cites one case in which there was a diffuse inflammatory condition of the glands on both sides of the neck. He performed a radical operation on the glands of one side leaving the tonsil intact, and on the other side removed the tonsil without touching the glands. On the side where the glands had been removed there was a recurrence, but on the side where the tonsil only had been removed the inflammatory condition subsided entirely. This experience has been encountered by others and it is my policy in every instance to remove the tonsil totally first and then if necessary (and it is sometimes necessary) to remove the offending gland six or eight weeks later. Often in these cases where the glands are removed, if the source of the condition, that is the tonsil, is allowed to remain, recurrence will almost invariably take place.

A very common condition of childhood which is very often overlooked and is of a great deal of importance is a suppurative condition of the ethmoid cells. Many children run about for weeks and weeks with a so-called cold which gradually impairs their general body vitality and which causes the parents to suspect that the condition is due to adenoids. One will often see a swollen and turgescient mucous membrane in the nose and pus or mucopus exuding from both nostrils which have become eczematous on account of the frequent wiping of the nose, or on account of the irritation of the secretion.

Too much instrumentation in these cases is absolutely pernicious and yet something must be done. In older children simple sprays may be used and the membranes kept clean by postnasal pharyngeal douching. In young children and in infants this is almost impossible and one must rely on such simple remedies as can be applied with a medicine dropper. The principle to aim at is to shrink the mucous membrane and allow as much space as possible for the elimination of the secretion. In infants and younger children I employ the simple expedient of liquid albolene perhaps using a few drops of 1/10000 adrenalin chloride beforehand. The use of boric acid or any other mild alkaline solution is permissible if one is sure to use some oily liquid after it,



but the use of these alkaline solutions alone will cleanse the mucous membrane to such an extent that their protective covering is removed and therefore the passages are more open to infection. Argyrol in 10 per cent. solution often helps considerably, but I have known cases in which the suppuration has gone on to the extent of causing such a destruction that a radical operation was necessary.

The sinuses of children are more open to infection than one usually supposes. Anatomically they are very very small and in infants under one year of age it is seldom that the sinuses are well enough developed to allow of any infection at all, but cases do occur where abnormally large sinuses are present in infants and children and it is in these cases that infection must be looked for. The employment of any radical medicinal treatment will be liable to cause more harm than good, for the children fight against the treatment and often the continued crying and struggling will cause a reaction inflammation which plugs up the channels more effectively than they were before.

Of course, there are other conditions in infancy and childhood with which the specialists have to deal but those outlined above are the most common and occur so frequently that they must be given serious attention. As a rule the, general practitioner is not competent to deal with such cases and where nasal obstruction or nasal suppuration lasts over a considerable length of time the only wise course to pursue is to refer these cases to the specialist who can use the proper instrumentation in examination and diagnosis of conditions which may turn out to be far more serious than one would at first suppose.

11 WEST. EIGHTY-FIRST STREET.

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## THE MARANTIC INFANT.

BY

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MARASMUS is fortunately not so much observed in pediatric practice unless one be called into the tenement house districts. In hospital, institutional and dispensary work, however, it is more or less constant.

In the International List of Causes of Death, the word *marasmus* is held as insufficient—this because of frequent misuse at home and a different definition abroad.

The term as used by our foreign colleagues is expressive of organic fault. Fruhwald, for example, in his handbook of diseases of children, writes: "Atrophy (marasmus) develops in children who, owing to some organic defect, are unable to assimilate their food, although the latter is both adequate in quantity and suitable in quality." Among American writers, however, the disease is classed as a condition without local organic lesion. As Holt expresses it, "A vice of nutrition only." Marasmus (from the Greek "to wither") is therefore only comprehensive as a disease entity when used according to this latter definition.

Synonymous terms in use are as numerous as remedies for whooping cough: Simple atrophy, athrepsia, pedatrophy, simple wasting, infantile atrophy, extreme malnutrition, simple infantile atrophy, gastrointestinal atrophy, chronic atrophy, progressive wasting, etc. Certainly there are many fancy ways of expressing the simple idea of starvation from nonassimilation of food. Between malnutrition, marasmus and acute inanition there, can be no sharp dividing line; nor is it essential to so subdivide, except, perhaps, to make a little more clear the degree of starvation present.

*Etiology.*—While improper feeding is the main causative factor, yet bad hygiene, and surroundings which do not afford a sufficiency of fresh air and sunlight, or inherited weakness of constitution are matters that must be very fully taken into account. An infant deprived of a plenitude of fresh air and sunshine will droop like a withered flower and its digestive powers will decrease often to a point where even fully adapted food is not properly assimilated.

Under the first head, improper feeding, the use of condensed milk easily outranks all other faults. Among the poorer classes this preparation is widely employed as being cheap, easy to make into mixtures and of indefinite keeping qualities. While condensed milk may be made into a proper food, for temporary use, by such a dilution, for example, as one in eight, with cream addition, the average mother uses a greater dilution and omits cream. Some of the babies receive a mixture that would undernourish a premature kitten. The writer has for several years made it a point to examine for rachitis all babies who have been fed for any length of time on condensed milk. He seldom fails to find it. Such commercial infant foods as do not call for mixture with cow's milk are usually creators of the marantic condition. A proportion of cases are found dependent upon the improper

modification of the proper artificial food, *i.e.*, cow's milk. Analyses of such group would doubtless show, in the large majority, mixtures too weak for the infant's needs. Too weak occasionally in fats, most often in proteins.

*Diagnosis.*—The marantic infant presents a picture so striking and so familiar that description is superfluous. Some of us perhaps, would claim to recognize such cases a block away. It is on this ready recognition that we sometimes fall into grievous error. The younger brothers of our profession especially are prone to say "marasmus" whenever the little pinched features, claw-like hands and pipe-stem legs appear. A searching examination is necessary to exclude wasting from organic disease. Tuberculosis, for example, is difficult to exclude. I have seen more than one case of hereditary syphilis diagnosed as marasmus, likewise the wasting due to empyema. Gastroenteric disease must also be considered. Thinking that he who runs may read the signs of marasmus, the runner must be sure he isn't going too fast.

*Prognosis.*—The prognosis must be guarded; it will depend on the condition of the child and its surroundings, together with its response to proper measures of feeding and hygiene. The age of the infant and the duration of the marantic condition are factors of importance. The outlook in a given case will depend, in the largest degree, upon environment, in other words, whether every detail of treatment can be carried out. The liability of these nonresistant little ones to intercurrent disease should be borne in mind.

*Prophylaxis.*—An ounce of prevention in this disease is worth many pounds of cure and prophylaxis is, therefore, the essential thing. Education along proper lines has saved and will save thousands of little lives which are valuable in our political economy. The Spartan idea of backing up the theory of "The survival of the fittest" by exposing weak infants upon the mountains has no place in our modern preventive medicine. It is our desire to make the weak infant strong, but far more to prevent his being weak.

There is room for much more of effort along these lines—room for more instruction, for more milk stations, for better milk, for central laboratories supplying the stations with special formulæ ordered by physicians, for better fresh air opportunities, for improved tenements, for more extended institutional and hospital facilities.



Harper's Weekly estimates that there are 12,000 births annually in the borough of Manhattan alone, where the help of the milk stations and the instructions of visiting nurses are vital necessities for the welfare of the babies. Millions are being given to endow colleges, to found public libraries; the babies have had no just share in the plans of our wealthy and public spirited citizens. There is an opening here for men of large means who wish to give without pauperizing, an opening to give life and strength to the little ones, who will be the men and women of tomorrow.

*Treatment.*—First and foremost, a wet nurse offers the marantic infant its very best chance. Unfortunately not one case in a hundred can be so handled through lack of means on the parent's part or lack of such provision in institutions. In hospitals having both children and maternity divisions a breast is occasionally available. It may seem utopian, yet it is possible that some day we may have pavilions for the care of these children with a sufficiency of foster mothers, separate rooms and a plenitude of fresh air and sunshine. So long as we believe that human lives are worth saving, so long will there be a chance for such a development as this. The ordinary hospital ward is no place for these cases. No matter how carefully the food is adapted, the baby still is handicapped by the necessity of spending practically all of its time in a crib. The exercise afforded in being carried about—the daily outings—in other words, the individual care that the little one should receive—these advantages cannot be given without a much larger force of attendants than is generally found. Under present conditions we must try to nourish the infant artificially and give as much fresh air and sunshine as the limitations of environment will allow. Chapin much reduced his mortality and best solved the problem—so far as it can be solved without wet nursing—by organizing a society to place the little ones in children's country homes, just enough being paid in the way of board to cover expenses.

A cardinal fault is to give the baby too strong mixture at first. A case being eight months old, a six months' formula is tried. But the little patient happens to weigh only nine pounds, not much above birth weight and has badly impaired digestive functions at that. One might well feel his way with a four to six weeks mixture, after resting the stomach for a day or so upon a barley-water diet. It takes a man some time to get rid of the notion, drilled into him by text-book feeding tables, that *age* is

the main factor in the selection of a formula for a baby. No rules or set of formulæ can be given, of course, for the marasmic cases, percentages must be varied to suit the individual.

Recent investigations would indicate that these little patients have their greatest difficulty in handling the fats of cow's milk. Fat percentages must therefore be kept low, 1 to 1 1/2 per cent. is proper at the start, with increase shortly to 2 per cent. Above this in most cases it is not advisable to go, although a further half per cent. is tolerated in some cases.

The proteins should be rather high, but the weakened digestion will often cause the appearance of curd in the stools. By the use of whey, cream and skim milk modifications, "the split protein method," the infant may receive a sufficiency of this vital food element with light digestive tax. Finkelstein to the contrary, the writer, after experience covering a period of years, finds these mixtures of great value in the majority of cases. While the figuring of split protein formulæ has heretofore been a complicated matter, a way has been devised by which the practitioner may employ them with ease and delicate scientific accuracy.(1)

Sugar, in any form of food, may be started at 5 per cent. and increased to toleration, usually 6 1/2 per cent.

Recent experiments by Holt and Levene(2) give indication that the addition of olive oil to the usual diet improves the utilization of the total fat. The deficiency, therefore, caused by the cutting down of fats, can be made good. This is extremely desirable and has worked well in the writer's practice during the past few months. A half teaspoonful of the oil is given twice daily, immediately after feedings. In most cases the frequency of the dose may be gradually increased until it is given after each feeding—six or seven times a day.

Where ordinary modifications of milk are employed, the use of cereal waters or gruels is a matter of consideration.

Partial or full peptonization is sometimes necessary for a limited period, especially where the proteins are not split. The addition of sodium citrate, one or two grains to each ounce of the milk and cream in the mixture is often an efficient substitute. "Malt soup" is a concoction worth bearing in mind for temporary use—it will occasionally adapt itself and cause an increase in weight where other diet measures have failed.

It is surprising, sometimes painfully so, how the weight of these little ones may change in a few days. There must be an accurate weighing every second, or at the most every third day.

Instead of being reported as to their character, the stools themselves should come under the observation of the physician.

These infants, showing as they do, a tendency to subnormal temperature, will present a cool body surface often, with cold hands and feet. Artificial heat is very frequently indicated. The hot water bag or bottle will generally suffice—with extreme care not to cause burns. A very weak baby with markedly subnormal temperature may require wrapping in cotton wool after inunction with oil.

Where there is but little crying, only the weak marantic wail, crying spells must be induced several times a day to expand the lungs. Annoying the baby will sometimes accomplish the result. Most often it will have to be spanked, *à la Holt*. Orders for this process are entered, in the writer's hospital wards, as for "the breathing exercise."

Daily inunctions of the infant's body with fats are of some possible value—cod liver oil appears to be the most fashionable application, at least among the laity. Olive oil is a desirable substitute. Those who have had dealings with the marantic infant will have noted that, owing to the character of the stools, the odor radiated in the immediate neighborhood is not that of an exotic flower, not even that of the common, or garden variety of geranium. The admixture of a constant, stale cod-liver odor might be held as a sufficient justification for a mother to desert her own child.

469 CLINTON AVENUE.

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#### REPORT OF A CASE OF STREPTOCOCCUS EMPYEMA COMPLICATED BY ERYSIPELAS.\*

BY

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CHILD I. Sp., six months old, was admitted to Beth Israel Hospital (Dr. Huber's Service) June 15, 1910. The family history was negative; the baby was breast-fed and perfectly well until four weeks before admission, when he was vaccinated. The vaccination did not heal; there was always some sloughing.

\* Case presented before a meeting of the Alumni of the Beth Israel Hospital, December, 1911.



The present illness began three days before admission. There was high fever, vomiting, dyspnea and mild cough. On examination, a distinct pneumonia was found at the left upper lobe posteriorly and flatness at the lower lobe.

Moro and Von Pirquet tests were negative. The urine contained traces of albumin, but no casts. The blood examination showed hemoglobin 65 per cent. and marked leukocytosis from 19,000 to 39,000.

On June 22, signs of effusion in the left side of the chest were quite marked and an exploratory aspiration at the seventh interspace was made and pus obtained. On the twenty-third of June, a thoracotomy was performed and a considerable amount of thin pus evacuated which contained numerous streptococci, but very little fibrin.

Three days after the operation, erysipelas appeared around the incision, and spread all over the body and extremities during the course of ten days. Internal as well as local remedies had no effect on the spread of the disease. We then resorted to the injection of a polyvalent streptococcus serum. From the first to the fifth of July, we gave five injections—85 c.c. in all. The serum seemed to diminish the severity of the disease.

The empyema did not improve, although there was ample drainage from the cavity. There was some necrosis of the ribs. The hectic temperature continued for about two and one-half months. During this time, horse serum was injected into the pleural cavity several times, the total quantity being about 60 c.c. These injections were made at intervals of two or three days. The horse serum appeared to have a marked influence on the character of the pus and the number of cocci was somewhat diminished. The change for the better was simply temporary, the empyema with the rise of temperature persisted.

On September 5, I made a resection of the sixth and seventh ribs and by introducing the finger into the cavity broke up some adhesions of the lung and a yellowish-brown pus was discharged.

During the months of July, August, and September, and the first half of October the child had intermittent pyrexia. He had six attacks of bronchopneumonia, almost a steady gastrointestinal derangement, mostly diarrheic, some rise of temperature and anorexia. In spite of medication and change of diet, the child did not thrive. The wound was dressed until November 23, when it healed completely. The child showed marked improvement during the month of December and gained 4 pounds.

The points of interest in this case are: First, the outcome of the case. According to Holt, (1) the mortality of infants under one year, particularly hospital cases, is very high—fully 90 per cent. Second, E. Feer(2) claims that the prognosis of streptococcic empyema is bad. He cites Netter who lost seven out of nine cases operated upon, his cases being much older than the one

described. Third, according to Hans Spitzzy,<sup>(3)</sup> the prognosis of erysipelas in infants is absolutely unfavorable, although it gets better with each year. Erysipelas ambulans is in itself a serious affection and more so as a complication of another disease. Fourth, six attacks of bronchopneumonia and the gastrointestinal disturbance having lasted throughout the summer months, the baby being so young, made the case very difficult to contend with. Fifth, the serum therapy during the migratory attacks of erysipelas and the horse serum injection into the pleural cavity undoubtedly had something to do with the recovery of the baby.

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2. E. Feer. Diseases of Children, Pfaundler and Schlossmann, 1908, vol. iii, p. 400.
3. Hans Spitzzy. *Ibid.*, 1912, vol. v, p. 191.  
50 EAST NINETY-SIXTH STREET.

## THE SHORT SPICA IN THE TREATMENT OF HIP-JOINT DISEASE.

BY

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IN the relative order of frequency of tuberculous disease of the bones and joints the hip-joint is attacked secondarily to the spinal column, and much more frequently in childhood than in adult life. The disease is a slowly progressive one, with more or less destruction of bone and joint tissues. In as far as possible the body resists the progress of the disease, rest of the affected parts being maintained by muscular spasm. If uncontrolled, the process runs its course in from three to five years, when natural cure may result, leaving the joint in a more or less destroyed and distorted condition. This end can be artificially prevented, the disease can be controlled, its destructive progress checked. The means thereto are

(a) Surgical intervention with removal of the diseased bone.

(b) Enforced rest, by mechanical means to assist nature's cure, while the limb is maintained in the correct attitude, with or without the administration of medicines, or operation.

Undeniably, ideal surgical interference is limited. Only complete removal of an entire tuberculous focus, or of the numer-

ous foci, will be curative, and this accomplishment we can never be fully certain of in the hollow bones.

As the removal of the end of any bone (epiphysis) will stop its growth, it is not advisable to operate in children on account of the resultant shortening. Operative intervention can only be advised even in adult cases where rapid recovery from a serious illness is of more importance than the maintenance of a good functionating limb. If the disease has so far progressed as to demand excision, a perfect functional result cannot be expected for the integrity of the joint is lost.

Expectant (fixation) treatment is, therefore, of necessity the one usually selected. For though retardation of growth of the limb is the rule after coxitis, and this bears a distinct relation to the amount and duration of restraint, still complete interference with function in the diseased joint must be enforced for a long period as the least of evils.

Its objects are:

1. To give relief and comfort.
2. To arrest the progress of the disease.
3. To prevent deformity or contracture.
4. To overcome existing deformity.

The fixation is based upon natural law—complete rest, producing local anemia, being found to hasten local repair and body resistance and avoiding further traumatism. In one important respect this differs from the spasm naturally maintained, in that the most useful and restful position of the leg is enforced. At first it was assumed that traction of the limb was always a necessary adjuvant to immobilization, in that it tends to keep the diseased surfaces of the joint separated; this to prevent its destruction with consequent ankylosis. While lying prone this can be done, but except in the very young the length of time required for treatment in the recumbent position seriously impairs the general health. So portative apparatus combining fixation with traction is indicated. Of late it has been proved that no apparatus can satisfactorily maintain this separation of the joint when the erect posture is assumed and weight put upon the part. Nevertheless the long or short traction hip splints, cumbersome and irksome as they are, are still very generally used. They consist of a long straight steel bar running down the outside of the body and limb, larger by several inches than the leg and with a right angle cross-piece and a hard rubber pad upon which the child walks. Above, the brace is attached to the body



by means of a ring and straps, below the foot hangs freely and is pulled down to the cross-piece by means of straps and buckles. On the well leg a high sole is made on the shoe, so that the child practically walks on a stilt.

The traction splint is necessarily heavy to be strong enough and immobilizes so much of the trunk and limb as to prevent any enjoyment of free body motion. The fixation is not complete and the traction is necessary to aid this; in itself the splint has no effect on separating the surfaces of the joint. The employment of the adhesive straps to the leg, continuously constricting the blood-vessels, necessarily causes atrophy and more or less irritation of the skin of the leg, and often marked relaxation of the ligaments of the knee-joint. The ugliness of the splint is irksome, its restraint weakening to the general health of the child.

It has long been recognized that after very severe hip-joint disease with much destruction, ankylosis of the joint, so long as a useful weight-bearing nondeforming position of the limb could be maintained, was rather better than otherwise, and a movable distorted joint a source of evil. Furthermore, fixation alone, if early enough applied, will as effectively counteract the disease as traction and fixation.

Basing his treatment upon these findings, Lorenz employs a short plaster-of-Paris spica encasing thigh and pelvis only. This gives absolute immobilization of the hip-joint and the position of natural rest and protection, abduction and extension, can be produced while it is being applied and maintained naturally by it after it has hardened. The result of treating hip-joint disease by this means is satisfactory enough to make its employment very general.

The method of application of the spica is as follows:

The child is placed upon its back on a hip and shoulder rest. The shoulders are held above the feet by an assistant, the feet being supported by another. Over the body and affected limb seamless shirting is drawn, and under this runs a flannel or silk scratch band. Over the shirting padding is wound to sufficient thickness, especially over the anterior superior spines, the perineum and at the knee. The leg is now drawn into the position of abduction and overextension with slight traction to maintain this attitude. If flexion and adductive deformity are present they must, as far as possible, be overcome and any rotation of the leg be prevented. Then if ankylosis occurs later the real shortening of the limb from destruction of the joint parts is

masked and equalized by the necessary tilting of the pelvis. When ankylosed the leg is brought down parallel to its fellow in the act of locomotion. While this position is being maintained the plaster of Paris is applied and should extend from just above the pelvis to the knee. It is of importance to mould it snugly over the iliac crests and around the condyle of the femur. This holds the pelvis and thigh firmly and prevents slipping of the spica or rotation or movement in the hip-joint or of the leg. The plaster is made thickest around the joint and in front of the body, to prevent breakage as it is well cut away here.

As soon as the bandages begin to set the patient is taken off the hip rest and while lying on a table, trimming is begun. The front part is cut out along its upper border to below the umbilicus, along its lower so as to expose the genitals and allow right-angle flexion of the healthy thigh. On the sides it is left high enough to encase the iliac crests well; behind, the buttocks are left exposed and the upper border is cut out far enough to permit as free a motion of the spine as possible. At the knee the front and back are trimmed away sufficiently to allow right-angle flexion of the joint and free motion of the patella, but it should extend laterally well over the condyles. When the spica has fully hardened, which should take place in fifteen to twenty minutes, free parts of the shirting are drawn over it and sewed together so as to completely cover it. The scratch band is now pulled up and down to test its freedom of motion and is then tied together *over* the spica and should be used by the patient daily all around to insure perfect cleanliness of the skin under the bandage.

On account of growth and also to make observation of the progress of treatment certain, the spica is changed about every three months. Should any vicious position not have been fully overcome we employ more marked corrective abduction and extension, and the spica is reapplied.

It has to be worn generally two years or more and its discontinuance depends upon what is revealed by the x-ray, together with the clinical findings.

Observation of the patient should be enforced for some time, even after cure appears complete.

During the progress of the disease and the time of treatment any of the following complications may arise:

1. Exacerbation of the local disease.
2. Abscess formation.

3. Rupture of pus sac externally with sinus formation.
4. Extension of the tubercular disease to other joints.
5. Assumption of distorted position of the limb.
6. General cachexia, amyloid degeneration of internal organs and metastasis.

Should exacerbation occur, which is rare, rest in bed with complete fixation is indicated. As soon as possible a long spica including the calf and foot is applied, and is changed to the short spica only when the acute symptoms have subsided.

Should abscess formation occur the pointing sac should be well protected. The pus is usually absorbed in time after the acute destructive process of disease causing it is controlled. On account of the danger of mixed infection and sinus formation, aspiration or incision are only indicated when the abscess is very large, ready to burst, or when extensive burrowing occurs, as this may extend to the periosteum of the femur causing tubercular osteoperiostitis.

For the sinuses several methods of treatment have been employed, such as injections into them of iodoform, glycerine, balsam of Peru emulsion or bismuth paste. The latter has been the most successful often bringing about closure of the sinus and hastening repair in the diseased joint.

If some other joint becomes involved, which is rather rare, such treatment as is indicated must be employed.

If distortion of the limb follows the cessation of the disease, operative correction is necessary to overcome it.

General means must be employed to overcome the systemic poisoning of the disease; fresh air, sunlight, light wholesome diet, fats, such as are indicated in any tubercular cases.

The employment of the spica is very satisfactory. Abscess formation is rare. End results are usually good, the limb after recovery is firm, warm, but slightly atrophied and the knee and ankle-joint are well maintained. Contractions and distortions never occur if the spica is always carefully applied. The time of recovery is longer delayed than by brace treatment.

Finally, during the time of treatment the children are but slightly inconvenienced by the spica; their gait is rather good on account of the short leverage of the fixed portion of the body. They wear their clothes over the completed dressing, wear no high shoe, suffer no mental anguish through ridicule on account of undue clumsiness or distortion.



## BRIEF OF CURRENT LITERATURE.

## DISEASES OF CHILDREN.

**Infantile Diatheses.**—Geo. Schreiber (*Arch. de méd. des. enf.*, June 22, 1912) defines a diathesis thus: a vice of nutrition with which some children are born, which determines peculiar forms of reaction to various pathological agents, and which renders them vulnerable under conditions which would do no harm to a normal organism. There is permanent trouble with their nutritional processes. The diatheses which the authors take up here are the lymphatic or scrofulous and the arthritic. In lymphatism the children are born of sick, enfeebled, or old parents, and this heredity has an important effect on their lives. Combined with this are bad hygienic conditions, lack of fresh air, sunshine, poor food, etc. These subjects are easily attacked by all sorts of infectious diseases; they are subject to catarrh, sore throat, and cough on slight exposure. The lymphatic system is overdeveloped and the glands enlarged in the neck, axilla, etc. These children are pale, anemic, slow of movement; they may be fat and sluggish, or thin and weak. All sorts of microbes, generally saprophytic or pyogenic attack them easily. Running ears are frequent, the nose is large and flat, the lids are subject to blepharitis. These are the scrofulous children of the older authors. The arthritic child is also an hereditary diathetic. These children cannot tolerate bad feeding; they may show all the usual symptoms of arthritism, gout, lithiasis, migraine, asthma, or obesity; they also have skin troubles, constipation, circulatory troubles, respiratory difficulties, digestive failure, and genitourinary difficulties of all kinds, such as enuresis, dysmenorrhea, etc., and nervous or rheumatoid symptoms. The prophylaxis of these diatheses demands the prevention of the marriage of such persons as are likely to beget these children. Aside from this we have only hygienic and nutritional means to use in the actual treatment of the children.

**Mucous Gastritis in Infancy.**—Under this name, E. Cautely (*Brit. Jour. Child. Dis.*, 1912, ix, 241) describes an affection characterized pathologically by catarrh of the gastric mucosa with excessive secretion of mucus, and clinically by vomiting of large masses of tenacious mucus. The vomiting is not as projectile as in typical pyloric or hypertrophy nor are several feedings retained before it occurs. These cases are comparatively rare in the breast fed. For some reason, such as a chill or unsuitable diet, a catarrh of the gastric mucosa is set up and may become very severe. Occasionally it is due to too high a percentage of fat in the diet, and possibly it may be started by preservatives present in some creams. In certain instances it is

due to an infective agent, notably those cases in which there is a coincident ileocolitis or colitis. It is reasonable to suppose that malnutrition from any cause is a predisposing factor and that the disease may be a sequel of an acute gastritis. The affection is most marked in the first three months of life, and is rarely severe in older infants unless they are small, premature or marasmic. Probably the older and stronger infants, though secreting much mucus, do not vomit so readily and pass it onward through the pylorus. Any cause which leads to stasis of gastric contents is apt to induce the condition. Hence, it may develop in the course of congenital hypertrophic stenosis of the pylorus. The prognosis is good if proper treatment is employed. Lavage is only a temporary expedient, preferably with an alkaline solution. In some cases the frequent administration of small doses of lime-water, bicarbonate of soda or citrate of soda is more beneficial. The diet must be simple and easily digestible. Cow's milk is curdled very readily, increasing the vomiting and distress. The writer has obtained the best results from sweet whey powder, a drachm in two ounces of water providing a mixture analytically identical with freshly made whey. Occasionally some of the proprietary foods are useful though they lack antiscorbutic properties. When the symptoms and mucus have diminished cream is gradually added to the milk and this diet is then slowly replaced by peptonized milk and then by milk and water or barley-water. Cane sugar is apt to increase the catarrh.

**Subcutaneous Injections of Sea water in Gastroenteritis of Children.**—Oliver Macé and René Quinton (*Rev. mens. de gyn., d'obst. et de ped.*, June, 1912) lauds the value of real sea water, not artificially prepared, in acute and chronic gastroenteritis of children. He has made use of subcutaneous injections of this plasma in acute and choleric enteritis, and in the ordinary acute and chronic types of the malady. His results are good in all these forms of gastroenteritis, but the water must be used in quite large quantities and must be continued for some time. A diet of water or diluted milk is not necessary and is inadvisable. Milk, given in good quantities and pure, yields the best results. This takes the place of the liquid which is being abstracted by the diarrhea and builds up the system. Appetite increases, the child grows plump, and strength improves at once. From 200 to 300 c.c. must be injected twice a day at first, and later one injection is sufficient. The author has made use of this treatment in fifty cases, of which thirty arrived at the hospital in the pre-agonic condition, yet the mortality was but 16 per cent. In atrepsia and atrophy its use is also of value and here its use should be prolonged at least six months.

**Pneumococcal Vulvovaginitis in Children.**—Recent methods have shown that pneumococcal peritonitis is not an uncommon affection in girls. To those who hold that the path of infection may be an ascending one by the Fallopian tubes two cases

reported by H. Chapple (*Lancet*, June 22, 1912) will be of interest. The pneumococcus is present in the vagina more frequently than is supposed. Chapple's two patients were girls thirteen and eleven years of age who presented symptoms of vulvovaginitis clinically indistinguishable from gonorrheal and other forms. Bacteriological examination showed the pneumococcus to be the cause and recovery rapidly followed the use of an autogenous vaccine and warm vaginal douches of zinc permanganate.

**Infantilism and Insufficiency of the Internal Secretion of the Testicles.**—A. Souques (*Presse méd.*, June 26, 1912) is of the opinion that absence of the internal secretion of the testicle is the cause of infantilism in the male. There are various types of infantilism corresponding to the particular genital organs that are affected by accident, operation, or atrophy. The differentiation of certain cells of the Wolffian body causes the formation of the testicle in the male and the ovaries in the female. Failure to properly differentiate causes nondevelopment of these glands. Therefore considerations that apply to the resulting male organs may also be applied to the female. Infantilism may be congenital, development of the secondary sexual characteristics never having taken place, or it may be regressive, occurring after atrophy of the genital glands. Castration of young animals arrests the development of the genital organs, hair, larynx, and muscular structures. Castration of adults changes only the secondary sexual characteristics. Eunuchs have all the characteristics of infantilism, when emasculation has been complete. When only the testicles have been removed there is an arrest of development of the scrotum, prostate, and seminal vesicles. The development of the testicle normally limits the height in some way, and its absence in the young male causes increased growth of the limbs, especially of the lower extremities. In another type of infantilism, atrophy of the testicle is secondary to that of other glands, the hypophysis and thyroid. Destruction of the hypophysis causes a typical type of infantilism with a disappearance of all the sexual characteristics. A third type of infantilism is caused by combined lesions of all the glands of internal secretion. The author concludes that a testicular lesion alone will not always cause infantilism; its degree is dependent on the age at which it occurs and the degree of the lesion. The secretion of the interstitial portion of the testicle assures the development of the genital organs and the appearance and continuance of the secondary sexual characteristics. Its destruction or alteration, by whatever mechanism it is caused, may cause hypoplasia or regressive atrophy of the genital organs, or the nonappearance, or disappearance of the secondary sexual characteristics.

**Renal Infantilism.**—There have recently been reported cases from the consideration of which these can be recognized a type of infantilism associated with, and apparently due to a perversion



of the renal functions. R. Miller and L. Parsons (*Brit. Jour. Child. Dis.*, 1912, ix, 289) present a study of these cases and two not previously recorded. They state that renal infantilism may occur with organic renal disease; in the cases hitherto reported this type has been due to nonsyphilitic chronic interstitial nephritis, whether cardiovascular changes be present or absent. Here the infantilism is likely to be of a severe grade, and death tends to occur during childhood or early adolescence from uremia or pneumonia. It may also occur apart from organic renal disease (diabetes insipidus). This type may be due to inherited syphilis, organic nervous lesions, and the other recognized causes of diabetes insipidus. The infantilism is not of a severe grade, and life may be prolonged. In either type the symptoms, polydipsia, polyuria and retarded development may be present from birth or may develop during early childhood. Hitherto no case of either type has been materially affected by treatment.

**Treatment of Umbilical Hernia in the New-born.**—Smester (*Jour. de méd. de Paris*, July 6, 1912) thinks that the direction generally given to treat umbilical hernia in the new-born by means of a pad and an adhesive bandage drawn tightly around the abdomen is wrong. He has seen a case in which local gangrene occurred under this treatment. He makes use of the following procedure: after making the site aseptic, he pushes the sides of the aperture together with his thumb and finger, and applies a small bandage of gummed taffeta, which he reenforces with a second and third bandage, and extra straps if necessary. He then consolidates the dressing with diachylon plaster, which with a second and third bandage, and extra straps if necessary does not touch the skin or cause any irritation, as is done with the ordinary dressing. The advantages are immediate retention of the hernia, reunion of the borders of the ring, freedom of movement of the abdomen, ease of changing the clothing and handling the child, and cleanliness. The author has used this dressing for thirty years with excellent results and no bad effects, cure taking place in all cases.

**Leukocytic "Inclusion Bodies," with Special Reference to Scarlet Fever.**—J. A. Kolmer (*Amer. Jour. Child. Dis.*, 1912, iv, 1) says that "inclusion bodies" are characteristically found in the protoplasm of the polymorphonuclear leukocytes of scarlet fever patients near the margin of the cell and are not connected with the nuclei. They present no fixed morphology but occur characteristically as rod and coccus forms. Due care must be exercised not to mistake the neutrophilic granules for round "inclusion bodies." Both forms may be present in any stage of scarlet fever and in the same smear. Early in scarlet fever most of the polynuclear cells will be found to contain one or more of the "bodies." The "bodies" are readily stained by the Giemsa, Manson, Leishman, Wright and Jenner stains. Ordinary methylene-blue will bring them out. They do not stain with eosin and hematoxylin. In order to determine whether or not

they are composed of chromatin, specific differential stains were employed to differentiate between chromatin and plastin. With the Giemsa stain the "bodies" are colored a faint bluish-green; with methyl-green and pyronin they present a fairly well-defined reddish color and with malachite-green and pyronin likewise a reddish color. They do not stain with iron hematoxylin. These stains would indicate conclusively that the "bodies" do not contain chromatin and are not protozoan in nature. They are probably composed of plastin, represent a degenerative process of the cytoplasm and are probably composed of spongio-plasm and are related to the presence of streptococci. They are present in the polymorphonuclear leukocytes of 94 per cent. of scarlet fever cases during the first three days after the onset of the disease. After this they diminish in frequency and are generally absent after the ninth day. They are to be found in 42 per cent. of diphtheria cases during the first three days of the disease; after this time they are but seldom found. "Inclusion bodies" are found not only in scarlet fever, but in other streptococcus infections. The diagnostic value of these "bodies" is necessarily limited. In serum sickness with a scarlatiniform rash their absence excludes scarlet fever with a fair degree of accuracy. Their presence in this condition, however, may not be due to scarlet fever but to the primary attack of diphtheria. They have, therefore, a negative value. An examination of the blood for these "bodies," however, is very simple and possesses value in aiding a differential diagnosis between scarlet fever, r  theln, measles and gastrointestinal rashes.

**Clinical Significance of Abdominal Respiration and of Deglutition Click or Fremitus; the Pneumonic-respiration-pause-cycle.**—L. Ott (*Amer. Jour. Dis. Child.*, 1912, iv, 7) states that respiration of pneumonia in infancy and childhood has a positive and pathognomonic postinspiratory pause. There are usually three to five postinspiratory pauses, then follows rapid rhythmical respiration without a pause, which ends in one postexpiratory pause and then the postinspiratory pauses begin again. There is a definite cycle in the recurring postinspiratory pauses which vary in number from two as a minimum and six as a maximum before the period of rapid pauseless respiration sets in. Just at the ending of one phenomenon and before the beginning of the recurrence of the period of the postinspiratory pause, one prolonged expiratory pause occurs, seeming to link the two changes in some unexplainable physiologic manner. In other words, between the pauseless respirations succeeding the postinspiratory pauses there appears one prolonged postexpiratory pause, thus leading to the beginning of the cycle. The writer names this symptom the pneumonic-respiratory-pause-cycle. This peculiar respiratory-pause-cycle is generally found in infantile and childhood pneumonia. Infants under eighteen months or children two years old manifest this condition more strikingly than older children. Let this same pneumonic child

fall into sound or natural sleep and all arrhythmia of respiration ceases; then you have still continuing the rapid respirations, but slower than when awake, and absolutely rhythmical and pauseless in occurrence. On reawakening the respiratory-pause-cycle is resumed. Whenever the postinspiratory pause begins to lessen and respiration grows less rapid the pause gradually becomes more postexpiratory and lessened postinspiratory. In other words, a transposition of the pause from postinspiration to postexpiration is a more favorable sign; the lessening of the respiratory pause or its absolute absence coupled with increased rapidity of respiration indicates a tendency to exhaustion and gravity. In cases of children of lowered vitality from disease other than lung troubles, manifesting cerebral symptoms, regularity of respirations negatives organic brain disease. This rule can also be applied to the pulse. If an infant having apical pneumonia with the characteristic respirations develops cephalic symptoms, and the breathing does not change from the pneumonic-respiratory-pause-cycle, one may conclude that the brain symptoms are merely symptomatic and not organic in character. The absence of persistent vomiting is confirmatory of this conclusion. By the term deglutition fremitus the writer means the sounds occasioned by the act of swallowing which are more readily conveyed to the ear through the area of a pneumonic induration. In the adult it does not seem as valuable as the transmitted voice, but in infantile pneumonia, where the act of crying is the sole manner of expression, this diffuses itself throughout the lungs in such a way as to confuse. Let the suckling infant nurse and while the ear is auscultating the lungs posteriorly note the area conveying the noise of the act of swallowing. A gurgling or clicking sound heard more distinctly at any point will indicate a pneumonic spot. The examination should be made after the infant has fasted for a long time and then when put to the breast it nurses with a feverish thirst and hunger and consequently swallows oftener and greater quantities, which aids in accentuating the deglutition fremitus through indurated area.

**Diagnostic Value of the Cutaneous Tuberculin Test of v. Pirquet.**—Examination of fifty cases has led F. L. Wachenheim (*Amer. Jour. Dis. Child.*, 1912, iv, 27) to believe that if 95 per cent. of all more or less run-down children give a negative reaction, a positive reaction in the small remainder becomes highly significant. Even an older child that responds to the cutaneous test should be regarded seriously, and by no means as one of the common run; an energetic antituberculous prophylaxis should be promptly initiated.

**Tetanus as a Complication of Burns.**—Reviewing the literature and two personally observed cases, C. Newberger (*Amer. Jour. Dis. Child.*, 1912, iv, 35) says that tetanus is not an infrequent complication of burns. The mortality is greater in cases occurring in the warmer months of the year. Tetanus complicating burns involving the trunk is more serious than when the burn



is on other parts of the body. The longer the incubation periods the less the mortality. The greatest number of fatalities occurs early in the complication. The prophylactic injection of tetanus antitoxin is advisable in all cases of serious burns.

**Metapneumonic Pleurisy in the Child.**—Georges Mouriquand (*Prog. méd.*, July 15, 1912) says that during convalescence from pneumonia attention should be especially directed toward the pleura. Metapneumonic pleurisy may be a mild complication, or a fatal one, according to the early recognition of its existence by the physician. When pleurisy occurs, if the fluid is free from bacteria and the polynuclears are unaltered, the pleurisy will be mild and easily cured. If the fluid contains altered polynuclears and many pneumococci it will become purulent, be much more severe, and last a long time. Diagnosis by the physical signs is not easy. An early exploratory puncture should be made and a bacteriological examination of the fluid will reveal the true condition, and dictate the treatment.

**A Case of Purulent Meningitis in the New-born.**—Bonhoff and Esch (*Zeitschr. f. Geb. u. Gyn.*, Bd. lxx, H. 3) report a case in which this condition followed an otitis media. The mother's labor has been normal but the baby developed evidences of cortical irritation with convulsions on the sixth day. A diagnosis of intracranial hemorrhage was made and a lumbar puncture undertaken. From the examination of the fluid evidences of an inflammatory process were demonstrated. The convulsive seizures continued and the child died on the fourteenth day after birth. The autopsy showed an extensive purulent meningitis with a well-developed otitis media on the right side. The left ear, the nasal cavity and ethmoid cells, as well as the umbilical vessels, and other possible points for the entrance of infection were perfectly normal. The bacteriological examination of the pus showed that the infective organism was a *Bacillus mucosus capsulatus*. The authors believe that the infection resulted through premature attempts of respiration by which liquor amnii and vaginal mucus found their way through the Eustachian tube into the middle ear. As the child was asphyxiated at birth and resuscitation attempted with the tracheal catheter, it is also possible that this may have carried the infection into the mouth. The condition is probably more frequent than is generally assumed, and it is important in similar cases to examine the middle ear.

**Nutritive Value of Milk Sugar.**—Calvary (*Zeitschr. f. Kinderheilkunde*, Bd. iv, H. 5) has studied this subject in connection with several methods of feeding infants and finds that as far as increase of weight is concerned, the milk sugar has a value equal to that of the other sugars ordinarily employed, especially where the stools show evidences of alkaline fermentation.

**The Use of Polycarbohydrates in the Diet of Young Infants.**—J. M. Brady (*Amer. Jr. Dis. of Children*, August, 1912) claims that mixtures of milk, water, and lactose with fat, protein, and carbo-

hydrates in the percentages corresponding to the widely accepted principles of infant feeding, do not give satisfactory results in an infant asylum. The institutional infant, even in the early weeks, is greatly assisted in making gains and weathering the unfavorable surroundings, by a liberal use of barley, maltose, dextrin, and cane sugar in the diet. The exhibition of polycarbohydrates in the diet is an excellent therapeutic agent for the infant in private practice who refuses to gain on the usual milk mixtures, or has already run down on the same. For this diet to be successful the protein must be liberal in amount and special attention must be paid to the fat, which should only be raised with the increase of the weight of the baby. The fear of rickets, according to Brady, need not be considered, the first requirement being that the infant be kept alive. Practical experiences have been found to override theoretical conclusions.

**Institutional Dentistry.**—F. A. Keyes (*Boston Med. and Surg. J.*, July 25, 1912) presents the results of his work in a large orphanage which included lectures to the children on the care of the teeth and regular oral examinations. Separate tooth brushes and powder were provided for each child and they were shown how to use the same. The rapidity of the decay of deciduous teeth over permanent teeth was marked. Out of 300 children there was not 1 per cent. who had ever had any dental care. In the extraction of permanent teeth a 1/2 per cent. of cocaine solution was employed. Twenty-five per cent. of the children required orthodontia. Of this number, all had either adenoids or tonsils. It was also found in studying the relation of oral prophylaxis to infectious diseases that these diminished remarkably after the system was instituted, the ratio being reduced 59 per cent. in the first six months.

**Certified Milk Unsafe.**—Kenelm Winslow (*Pediatrics*, July, 1912) states that from having been a strong advocate he is now convinced that raw cow's milk is not a safe food. He claims that various infections may be conveyed to milk from diseased udders of cows that cannot always be prevented even in certified milk, of which streptococcus and tuberculous infections are the most dangerous. An uncertain percentage of cows supplying certified milk are tuberculous. Raw cow's milk is liable to be contaminated with the organisms of many human infections which it is impossible to avoid even in certified milk. Heating milk at the proper temperature and for the proper time, followed by cooling, is the way to prevent milk-borne infections. Winslow claims that there is no sufficient evidence to prove that proper heating harms milk in its vital, chemical or physical properties, or lessens its food value, or in any way injures the health of persons, including infants, who take it. The cleanest milk is most suitable for heating, since only a percentage of the bacteria are destroyed. The only safe pasteurized milk is that properly prepared at home, or properly pasteurized commercially in the capped bottle.

**Intestinal Stasis in Children.**—L. E. Barrington-Ward (*Surg., gyn. and Obst.*, July, 1912) discusses the existence of this condition in tuberculous joint disease, rheumatoid arthritis, ulcerative colitis, appendicitis, etc., and finds evidence, both from the general condition of the patient and from the examination of the alimentary tract by the *x*-rays, of intestinal stasis in all these cases. Appropriate treatment is universally followed by beneficial results. These children who are the subjects of intestinal toxemia, whatever their secondary manifestations may be, present certain features in common which may be readily recognized. They are dull or querulous in disposition, thin and weakly, with feeble metabolism. Bismuth photographs were made and in some advanced cases operation was done on the displaced portions of the intestine with good results. In comparison with normal children, in whom bismuth is passed in from twenty-four to thirty hours, this may take from fifty to one hundred hours if stasis is present. Ward believes that infection of the urinary tract in children with the colon bacillus is always due to stasis. Treatment includes diet and the administration of liquid paraffin, with the operative treatment of adhesions where indicated.

**Administration of Mercury to the Mother for its Effect on the Nursling.**—S. V. Haas (*Arch. of Ped.*, July, 1912) tested the value of the administration of bichloride of mercury in the treatment of congenital syphilis and found that the effect upon the specific process, though positive, was slight, whereas gastrointestinal and nutritional disturbances when present, cleared up in a most remarkable manner. The method was also tested in gastrointestinal disturbances among nonspecific nurslings, and between 35 and 40 per cent. of over 200 cases thus treated were benefited. The dose was a tablet triturate containing one thirty-second of a grain administered to the mother three times daily after meals. For this reason the mother of a syphilitic child should be permitted to nurse the same, bichloride of mercury being administered during this time.

**Primary Tuberculosis of the Mesenteric Glands.**—C. Schram (*Amer. Jour. Surg.*, 1912, xxiv, 269) says that the recognition of tuberculous disease of certain mesenteric lymph nodes is not as general as is warranted by the frequency of its discovery at autopsy. After months or even years of latency it may cause tuberculous disease in any part of the body. It is most frequently found in children, hence the importance of a pure milk supply. Chronic constipation is a contributory cause. Obscure abdominal pain with digestive disturbance and rapid loss of flesh are indicative of the disease. During laparotomies for disease of the appendix or intestines, the mesenteric glands should be carefully examined. As mesenteric glands rank second in the etiology of general tuberculosis, their extirpation upon discovery is imperative.

**Stain for Diphtheria Bacillus.**—C. Ponder (*Lancet*, July 6, 1912)



describes a toluidin hanging drop method, which differentiates *B. diphtheriæ* from the other organisms in the same film more clearly than any other method, because while giving a double stain—blue bacilli with red granules—it shows the minute structure of all organisms very distinctly. It has a special value in demonstrating the organism in a direct smear without preliminary cultivation, as by this means, in a large proportion of acute cases of the disease, a much earlier diagnosis may be made. It also demonstrates the organisms of Vincent's angina if present. It is extraordinarily simple and rapidly carried out. A film is made on a cover-glass and fixed in the usual way. The stain has the following composition: toluidin blue (Grubler), 0.02 gm.; glacial acetic acid, 1.0 c.c.; absolute alcohol, 2.0 c.c.; distilled water to 100.0 c.c. A small quantity of the fluid having this composition, is taken up with a platinum loop and dabbed and spread on the film; the cover-slip is then turned over and mounted as a "hanging-drop" preparation and it is now ready for immediate examination with the one-twelfth objective in oil. The examination should be made with a strong *artificial* light such as a sixteen candle-power frosted electric bulb at a distance of from 6 to 8 inches from the mirror. The influence of the thin layer of blue fluid is in the direction of correcting the yellowness of the artificial light. One or two points must be attended to in order to ensure success. Films should be freshly prepared and thinly spread. The appearances are entirely different from those seen in a film stained in the ordinary way and mounted in Canada balsam. The organisms are plump and glistening, the details of their structure are sharply brought out both in the depth to which they take the stain and the actual color they take up. The different methods of taking the stain may be grouped as follows: 1. Certain cells practically do not take the stain at all. These are therefore seen as glistening white bodies. Some kinds of cocci, coccoids, oval cells, and streptococci present this appearance. 2. Some cells take on a blue color which may be light or dark. One finds certain cocci, micrococci, streptococci, streptobacilli, bacilli, etc., stained in this way. Hoffman's bacillus is included in this group and stains typically a dark blue with a light band. The spirochetæ and fusiform bacilli seen in Vincent's angina also stain dark blue. 3. Certain cocci, bacilli, and torulæ take on a red or pink color. *B. subtilis*, if present, is very conspicuous as a bright pink organism. 4. Some cells whose bodies are stained blue contain metachromatic granules that take on a red or pink shade. In this class one recognizes the typical *B. diphtheriæ*; the body of the bacillus is a pale glistening blue, while situated at different points along its length are bright and often deeply stained red granules. This appearance is extremely characteristic and it once attracts attention by its contrast to the accompanying organisms, which are generally more lightly stained. Some varieties of sarcinæ and yeasts will also be found to stain

in this way. Such organisms as these will not, of course, be confused with *B. diphtheriæ*, nor will diphtheroid organisms often be met with which give rise to difficulty from the fact that they make the stain in a way that resembles the true diphtheria bacillus.

**Survival of the Poliomyelitic Virus in the Stomach and Intestine.**—Simon Flexner and P. F. Clark (*Jour. A. M. A.*, 1912, lix, 273) state that since the poliomyelitic virus occurs in the nasal and buccal mucus in human cases of poliomyelitis it is inevitably taken into the stomach with the swallowed saliva. The virus survives the action of both the gastric and intestinal secretions and persists for a time in these organs. In human beings it leaves the body, in part, with the intestinal discharges, which are therefore a potential source of infection.

**Hyperemic Treatment of Acute Anterior Poliomyelitis.**—P. McIlhenny (*Bost. Med. Surg. Jour.*, 1912, clxvii, 87) says that taking it for granted that the inflammatory changes and consequent destruction in the cord are caused by an obscure organism, our aim must be to get rid of this virus and relieve the inflammation as quickly as possible, before permanent damage has been done; therefore, if we can cause an active hyperemia of the cord, or accelerate the current through its arteries, there is every reason to believe that the inflammatory process will become diminished and cell destruction stopped. In the writer's opinion this can be easily and effectually accomplished with Bier's dry cups using cups at least an inch and a half in diameter, applied for three minutes with one minute rest, and this procedure continued for an hour. He has obtained satisfactory results in five cases by this method. The alimentary canal is thoroughly cleansed, the limb or limbs lightly bandaged with cotton to keep them warm, stimulating liquid diet, and strychnia in minute doses. Cups, are applied intermittently to both sides of the spine, and directly over the posterior processes from the sacrum to the cervical region, for one hour daily, and this continued regularly until muscular soreness has disappeared and voluntary motion in the affected muscles begins to return; the bandages are then removed and massage begun, general diet gradually being allowed, and the cupping continued until the muscles have regained their tone. The writer believes that this treatment, applied before the fourth day of the attack will in many instances prevent a paralysis resulting, and in the majority of cases at least insure a useful and serviceable limb.

**Use of Celluloid Splints in Cases of Poliomyelitis.**—F. E. Batten (*Lancet*, July, 13, 1912) describes the technic of making the splints. A cast of the leg is made in the following manner. The leg is oiled, plaster-of-Paris bandages are placed in water, and after being squeezed out are wound round the leg from the foot to the thigh. When the plaster has partially set a cut is made along the anterior surface with a knife, and the cast divided with shears. The leg is removed from the cast, which is then

bound round with plaster bandages so as to bring the cut edges of the cast in apposition. It is of the greatest importance to get the leg in a good position while the plaster is setting. The foot should be at, or a little less than, a right angle to the leg, and the knee should be just flexed. The second process is to make a positive cast from the negative. This is done in the ordinary manner. The third process is to mold the splint on to this cast by placing layer on layer of gauze, impregnated with a solution of celloid, until a sufficient thickness has been reached to make the splint rigid. The advantages of this splint are great. It is strong, rigid, and light. In the case of a child aged three the splint for the whole leg weighed only 9 ounces. The splint can without discomfort be worn day and night, thus abolishing the necessity of separate splints for day and night use. Many patients can walk in them, whereas they would be quite unable to do so in heavier instruments; and they are cheap as compared to most other forms of splint. The disadvantages are the discomfort incidental to fixation of the knee-joint in an extended position and the inflammability of the splint.

**Infections Following Tonsillotomy.**—H. Koplik (*Amer. Jour. Med. Sci.*, 1912, cxliv, 30) calls attention to three distinct forms of sepsis which may follow surgical removal of the tonsils: 1. A form which runs an obscure fever for a week or more without causing any endocarditic or other lesions. 2. Those cases which run a temperature and show signs of a mild infectious endocarditis, or in which, as in the case of chorea, the endocarditis takes on a severe infectious, or so-called malignant, type, and are subsequently fatal. 3. A form of sepsis in which the infection is evidently severely hematogenous and causes destructive blood changes, with signs of sepsis such as profuse hemorrhagic ecchymotic areas on the skin, petechiæ, severe hemorrhages from the bowel, and areas of bronchopneumonia.

**Chvostek's Sign and its Significance in Older Children.**—Chvostek's sign, or the facial phenomenon, has been considered characteristic of tetany. By tapping with the finger or percussion hammer on the skin over the facial nerve, that is, about midway between the zygoma and the angle of the mouth, one obtains, when the sign is present, a lightning-like contraction of the muscles supplied by the facial nerve; the angle of the mouth, the side of the nose, and in marked cases the skin over the inner canthus of the eye and eyebrow display a sudden twitching. In examining 495 children of the poor applying for treatment. M. H. Bass (*Amer. Jour. Med. Sci.*, 1912, cxliv, 64) found this sign present in 3.2 per cent. He says that the sign becomes more frequent the older the child, up to 19.6 per cent. at ten to fourteen years of age. The presence of so great a number of positive cases in the United States, where tetany is relatively uncommon, is another argument in favor of considering Chvostek's sign in older children as distinct from any connection with tetany. The positive Chvostek's sign in an older child, as a rule, means a



neuropathic constitution. It seems especially common in children showing vasomotor irritability, and particularly in those suffering from orthostatic albuminuria. Chvostek's sign is easily elicited and should be more often used as an adjuvant in making the diagnosis of neuropathic children.

**Heliotherapy in Surgical Tuberculosis.**—G. Austin (*Med. Rec.*, 1912, lxxxi, 1074) describes the treatment of surgical tuberculosis employed by Rollier at Leysin, Switzerland, at an altitude of 5000 feet. This method consists in exposing the body of the patient to the sun's rays in open galleries communicating with the wards and facing due South. The actual seat of disease is uncovered for five minutes only, to begin with, as there must be no blistering or burning of the skin; the next day the region is treated for two periods of five minutes each, separated by an interval of half an hour; and on the third day these exposures are lengthened to fifteen or twenty minutes. At each séance a larger area of skin is uncovered, so that by the end of a week or ten days (for each case needs individual study) the entire body, the head excepted, is lying nude in the sun, even in midwinter. The head has to be protected for some time longer, to prevent congestion; but it too is also ultimately brought to tolerate the sunlight. The patients are wheeled out in their beds onto the galleries as soon as the sun appears in the morning, and lie there naked for hours under the influence of its healing rays, being only moved back into the house when the cool night air begins to make itself felt. The large windows of the comfortable steam-heated wards open down to the ground and are never closed, so that when the sun has disappeared behind the mountains the invigorating air continues the cure during the night hours. A carefully studied diet helps to build up and renovate the diseased bodies under treatment. No medicines are given. According to the necessities of the case the invalid is partly or entirely immobilized until the actual disease is cured; and only then, and in cases where it is absolutely essential, is an apparatus applied to correct deformities or straighten limbs. In those cases where an apparatus cannot possibly be dispensed with an opening is cut as large as possible at the seat of the trouble, so that the sun's rays can continue their curative action on the diseased region all the time that the patient is in plaster. When, in spite of the insolation an abscess seems about to open, it is punctured and the pus drawn off, and it has rarely been necessary to repeat this more than two or three times in a given instance. When an abscess has already burst and is infected on arrival, it is scraped and the cavity disinfected and then exposed to the full light of the sun with its walls laid wide open, a small antiseptic dressing being applied at night. The following statistics speak for themselves: Out of 369 cases of surgical tuberculosis treated by heliotherapy, in 284 (78 per cent.) recovery was obtained; in forty-eight, improvement; in twenty-one the condition remained stationary, while sixteen (4 per cent.) succumbed. These figures

appear more remarkable still when we consider that in 132 cases there was open tuberculosis with secondary infection. The sixty-one cases of Pott's disease of the spine (nineteen with abscess and ten with fistula and secondary infection) gave forty-five recoveries, ten improvements, three failures and three deaths. In coxalgia (closed form, with or without abscess) there were thirty-two recoveries, five improvements and no deaths; whereas in twenty-two cases with secondary infection there were only twelve recoveries, four improvements and three deaths. Closed tuberculosis of the pelvic bones also gave excellent results, five recoveries and two improvements in seven cases; but with secondary infection the prognosis is distinctly bad: one recovery and three deaths in five cases. In visceral tuberculosis the results were excellent; peritonitis and enteritis, twenty-seven cases (five with fistulæ) gave seventeen recoveries, three improvements and three deaths; renal and visceral forms, sixteen cases, with twelve recoveries and two improvements; genital forms, six cases with recovery in all.

**A Case of Spurious Meningocele.**—Schindler (*Jahrb. f. Kinderh.*, Bd. xxvii, H. 2) reports from Finkelstein's clinic in Berlin an interesting case of traumatic meningocele combined with a pachymeningitis, in which it was possible to obtain an autopsy. The child was thirteen months of age and developed a parietal tumor after having been struck with a ball in this region. A diagnosis was made of spurious traumatic meningocele with hemorrhagic contents. Lumbar puncture was done several times and the child seemed to improve as the fluid in the tumor subsided. Subsequent to an attack of grippe the child died and a very complete autopsy showed the presence of a tuberculous infection of the lungs and bronchial glands, together with a general miliary process including the meninges. There was present an extensive thrombosis of the cerebral veins and sinuses with large hemorrhages into the ventricles. There was an opening in one of the temporal bones which also involved the meninges. The writer believes that the meningocele was brought about by the intracranial pressure due to the pachymeningitis and that the opening in the bone was due to absorption following pressure atrophy. Lumbar puncture in this case not only aided the diagnosis but seemed to have a favorable effect on the condition and its adoption for this purpose is therefore recommended by the author.

**The Hypodermic Use of Hematinics.**—Lowenburg (*Am. Jour. Dis. Chil.*, September, 1912) reports the results of this method in the treatment of anemia in children, for which he uses a solution containing citrate of iron ( $3/10$  or  $3/4$  grain), cacodylate of soda ( $1/2$  grain), glycerophosphate of soda ( $1\ 1/2$  grains), dissolved in 20 minims of distilled water. This solution is non-irritating if injected deeply and the most favorable site for the same was found to be the posterolateral inner aspect of the upper portion of the arm. The author's report includes twenty

cases in which 202 injections were given, averaging about ten each. With three exceptions the patients were rapidly benefited, by the treatment and the writer concludes that in the hypodermic injection of hematinics we possess a quick, safe, and reliable method for treating the anemias of childhood. The combination of iron and arsenic compounds seems to have a better effect than either alone. Small doses of each give as good results as large ones and the tonic effect is noted almost immediately after beginning treatment.

**The Study of Infant Metabolism.**—Benedict and Talbot (*Am. Jour. Dis. Chil.*, Sept., 1912) refer to the necessity of an accurate knowledge of the energy requirements of infants and the energy content of their food in studying the rate of growth and in the treatment of nutritional disorders. The ideal method for determining the energy transformation of infants is by direct measurement of the heat eliminated and produced, such as that developed by Lusk, which, however, is generally excluded because it requires very expensive and elaborate apparatus. Indirect calorimetry, that is, a computation of the energy transformation from the gaseous exchange, depends on the measurements of the carbon dioxide produced, but is open to serious objection inasmuch as no proper control of the muscular activity is possible. The writers believe that there are other inconsistencies arising from the determination of the carbon dioxide in infants without taking the latter into consideration. They used an apparatus which was a slight modification of that described by Benedict and Homans (*Jour. Med. Research*, 1912, p. 409) for experiments on hypophysectomized dogs. This was used primarily to determine the amount of carbon dioxide excreted in the air and was furnished with means of recording graphically the amount of motion of the infant. Normal breast-fed babies were used for the experiments. A very close relationship was found to be established between the carbon dioxide production, the pulse rate, and the muscular movements of the infant, as recorded on the smoked paper drum. By way of a preliminary assertion, the investigators feel convinced of the importance of considering in all subsequent metabolism experiments the pulse rate of the infant and particularly the degree of muscular activity. The enormous variations in the total metabolism as affected by what might otherwise appear to be slight muscular activity, was such as to lead the writers to question seriously all experiments made in twenty-four hour periods, and they assert that all such experiments on infants made without known controlled pulse rates and without graphic records of muscular activity, are lessened enormously in value by the absence of these important factors.

**Fever Due to the Injection of Salt Solution.**—Samelson (*Monatsschr. f. Kinderh.*, Bd. xl, H. 3, 1912) discusses the claim made by Schaps and others that the subcutaneous injection of saline solution in infants is likely to bring about a rise of temperature. A



series of careful observations made with accurately prepared sterile solutions in sixteen cases, showed a rise of temperature in only one instance to  $37.5^{\circ}$  C. The writer believes that if fever results it is not produced by the saline, but by bacterial toxins contained in the solution, and for this reason only water completely free from either bacteria or toxins must be employed.

**Vaccines in the Treatment of Pertussis.**—Ladd (*Arch. of Pediat.*, August, 1912) has made a trial of this method in a series of nine cases, using a vaccine of Bordet's bacillus grown on a blood agar. In conducting the bacterial count the blood-cell method of Wright was used, and safety tests were made by injecting the vaccine subcutaneously into guinea-pigs. The cases selected for treatment were clinically typical, and a characteristic paroxysm was observed in the clinic in each instance. The blood counts showed relative increases in mononuclear cells. A minimum interval of five days was allowed to elapse between injections, and sometimes owing to shortage of material or to negligence in bringing children to the clinic, the interval was increased to ten days and sometimes longer. There were no general constitutional symptoms or local reactions at the site of the injections. In the early cases it was found safe to give twenty million bacilli at each treatment even to an infant, and later as much as forty million were injected at one time without ill effects. No other treatment was given, and as far as can be judged from the statements of the mothers, the paroxysms diminished in severity and number after the third injection. All the children recovered without complications on an average of five weeks after beginning treatment. The cases were mostly all in the third week of the disease when vaccination was started. Compared with the general results obtained in the hospital, where cases usually last two or three months, the vaccines seem to have had a favorable effect and are therefore worthy of further trial.

**Saline Solution in Epidemic Diarrhea.**—Mackenzie (*Brit. Jour. Child. Dis.*, August, 1912) claims that collapse in epidemic diarrhea is due to low pressure and accumulated toxins, and that the results obtained from injecting fluid are increased blood pressure and the passage of these toxins. It has been claimed that sea water plasma is preferable to the ordinary normal salt solution for this purpose, but from a series of personal observations the author believes that the latter is equally satisfactory. Subcutaneous injections should be resorted to, therefore, on the earliest indication of collapse and in the case of very young infants, at the first visit whether collapse is present or not. The immediate effect of sterile water seems to be the same as saline solutions, but it does not fully maintain the renal functions of the organism for more than twenty-four to thirty hours without repetition, whereas salt solution does not require repetition for from thirty-six to forty-eight hours.

# THE AMERICAN JOURNAL OF OBSTETRICS

AND  
DISEASES OF WOMEN AND CHILDREN.

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VOL. LXVI.

DECEMBER, 1912.

NO. 6

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## ORIGINAL COMMUNICATIONS.

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### THE PRESIDENT'S ADDRESS.<sup>1</sup>

BY

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THE twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists is an occasion which should fill the heart of every Fellow with joy and pride. Organized at the Niagara Hotel in Buffalo, April 19, 1888, in the presence of fifteen gentlemen interested in abdominal surgery, obstetrics and gynecology, this Association entered the ranks of special societies with the object of closer cultivation, advancement and encouragement of the studies and practices of abdominal surgery, obstetrics and gynecology. Its first regular annual meeting was held in Washington, D. C., from September 18 to 20, 1888, under the presidency of Wm. H. Taylor of Cincinnati, its first president, with W. W. Potter of Buffalo as secretary. The latter, who retained his position until the time of his death, was, particularly in the earlier years of the Association, an enthusiastic and tireless worker in the interests of this Society which owes much of its present position and standing to his unceasing labors in its behalf. The Washington meeting was attended by twenty-six of its forty Fellows who were then enrolled in its list of membership and thirty papers were presented, not including a symposium on extrauterine pregnancy in which nine essayists participated.

The success of this meeting and the enthusiasm and interest

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

displayed by all present was an auspicious beginning, and any doubt and uncertainty concerning the future and necessity of this Association was at once and forever dispelled from the minds of those present. We all returned from Washington with new zeal and the sanguine feeling that this Association was destined to take a prominent and important place among the special societies of the country and would accomplish a great amount of good in the field which it had chosen for its labors. A quarter of a century of its existence has not disappointed its organizers, but on the contrary has surpassed their keenest expectations.

It would be a mistake, however, to suppose that during all these years this Association has had easy and clear sailing, with no turbulent waters to hamper its course and no disturbing elements in its path; on the contrary, enemies arose from many sides immediately after it had become launched, assailing it on all occasions and at times some within its own ranks, but they only served to make this body stronger and healthier and it emerged from all these attacks unharmed and more vigorous than ever before. To-day we have one of the most powerful and influential organizations of this character in existence, with a membership of 134 ordinary Fellows and a large list of honorary and corresponding Fellows, living in almost every section of the civilized globe.

Among these may be found many of the leading and most distinguished representatives of abdominal surgery, obstetrics and gynecology of the world. The work of this Association during the twenty-five years of its existence has very materially contributed to the wonderful development of these branches of medicine which at the time of its organization were practically in their infancy, at least that of abdominal surgery. The handsome twenty-four volumes of our transactions issued by this Association bear witness of the activity, industry and high quality of the work of its Fellows and may be considered the history and the yearly records of the progress and advances made in these branches of medical practice, so closely identified has this society become with the marvelous developments and growth of these departments during the last quarter of a century. While the charter members of this Association were the pioneers in these subjects at the time of the organization, they with the Fellows subsequently enrolled in its membership have to-day become the leaders and masters in them.

While we have every reason for congratulation and rejoicing



at the work accomplished by this Association during the past quarter of a century, there must also a feeling of great sorrow and sadness creep into our hearts when we look back over these twenty-five years, at the thought of the missing ones. Not a few who started out with us in youthful enthusiasm and high ambitions and a promise of many years of useful activity and helpfulness among their fellow-men, have been taken away in the midst of their labors and are no longer in our midst. The yearly tribute to that grim reaper, Death, has been steadily growing and we miss to-day many kind, dear and familiar faces, who endeared themselves to us at our annual gatherings and who enlivened our meetings by their presence, their humor and their active participations in the discussions. It is sad to think that we will meet them no more and that their voices will never sound again in our meeting rooms. Some of these are a distinct and irreparable loss to our society which will be felt for many years to come. We mourn the loss of thirty-eight members who have died during these twenty-five years. Of the fifteen gentlemen present at the organization of the society in Buffalo, only five survive as members.

The advances, more particularly in abdominal surgery and gynecology since the foundation of this society, have been truly phenomenal. At no period in the history of medicine, I am safe in saying, have such evolutions and growth—revolutionizing the entire practice of medicine—been experienced. This society has been singularly fortunate in having had its inauguration just at the eve of these remarkable changes, because it acted as an incentive for each individual Fellow to contribute his own share, large or small, in the development in these departments of medicine, and when the history of medicine covering the last twenty-five years is written, not a few Fellows will be credited with a large proportion of the work accomplished.

To realize and appreciate what has been accomplished in the last quarter of a century a brief retrospect of the status of abdominal surgery and gynecology just previous to that period should prove instructive and helpful, particularly to the younger members of this society. Not too much credit can be given to Sir Joseph Lister who by his discovery of wound infection and its prophylactic treatment made these advances possible. Its full value and importance were, however, very slow in being recognized by the profession, and its general adoption antedated the foundation of this society but a few years. Well do I re-

member seeing many operations performed by some of the best known surgeons in London, neighbors of Lister, in the year 1884, who apparently had never heard of Lister and his discovery. Speaking in a general way, we may mark the year 1880 as the beginning of the new era in surgery. Up to this time abdominal surgery was practically limited to ovariectomy, though in a few isolated cases, either through a mistake in diagnosis, or in the hands of an unusually bold and enterprising surgeon, other operations had been attempted and at times carried out with success.

Hysterectomies for fibroid had been performed not infrequently but with such a high mortality that there was little incentive for the ordinary surgeon to imitate. Until about the year 1883 such eminent operators as Schroeder, Martin, Tait and Bantock, the pioneers in this work, had a mortality of about 30 per cent. Keith was the first to improve these results and only a few years later the extraperitoneal treatment of the pedicle, by means of which the cervical stump was anchored and fixed in the lower angle of the incision, enclosed by a clamp, serre-neud, or an elastic ligature, had become so perfected that the results in the hands of the best surgeons became quite favorable. The intraperitoneal method, originated by Schroeder in 1882, proved exceedingly dangerous and found few advocates until Simpson of New York in 1889, demonstrated that by ligating the ovarian and uterine arteries the danger of hemorrhage from the stumps, hitherto the bug-bear of the intraperitoneal methods, could with absolute certainty be avoided. The present ideal method of suprapubic hysterectomy, the most beautiful and satisfactory operation in the range of abdominal surgery, we owe to Baer of Philadelphia, who first described it nearly twenty years ago. Until that time many surgeons preferred the removal of the uterine appendages as the far safer operation for bleeding fibroids, but the results were far from encouraging.

The unsatisfactory results of the operative treatment during these years of development, led to various attempts to relieve the unfortunate sufferers from uterine fibroids. Among these, electricity as applied according to Apostoli's method (of Paris), was for a number of years a subject of lively discussion in the medical circles, and for a time many enthusiasts claimed such remarkable results that every "up to date" gynecologist felt compelled to acquire the necessary and not inexpensive apparatus. Not only did the advocates of this method claim to

relieve the symptoms accompanying this neoplasm, such as bleeding, pain, etc., completely and promptly, but they saw rapid shrinking of the tumor, and in the course of time complete absorption as a result of the electrolytical treatment. These illusions, however, soon disappeared, and with them the much heralded and for a time apparently promising electrical craze.

To the great genius and wonderful skill of Lawson Tait we are largely indebted for the epoch-making progress in abdominal surgery, beginning with or near the year 1880. He recognized the fact that pelvic inflammation usually has its origin in the tubes, extending from there to the peritoneum. Up to this time practically all inflammatory conditions in the pelvis were regarded as a cellulitis, though Bernuitz and Gompil in the year 1862 described very clearly the pathology of pelvic inflammation, and Noeggeroth in the year 1878 had pointed out its etiology in his classical little book on "Gonorrhea in the Female." It required, however, the actual demonstration on the operating table and the specimens of ovaries and tubes removed from the living subjects to convert the doubting profession and to revise their old and long-held views of pathology. Tait's results were so brilliant that he soon found pupils and imitators all over the world and the "Tait operation," which the removal of diseased ovaries and tubes was then called, came rapidly into vogue and was popular with the surgeons, to such an extent that it was greatly abused in many instances and threatened to discredit surgery for a time on that account. In 1883 Tait performed his first operation for extrauterine pregnancy with ruptured tube, and from that time on found many such cases among his material, showing thereby, that ectopic gestation was not the rare accident that it had hitherto been regarded, but a very common indication for surgery. His experience with this condition resulted in a complete change of views hitherto held concerning the pathology of extrauterine pregnancy. His operative skill was soon employed in other parts of the abdomen, especially about the gall-bladder and biliary ducts in which he, with Mayo Robson and Langenbach of Germany, was one of the pioneers.

In uterine displacements the pessary was the only means known to correct the malposition, until Alexander in 1882 conceived the idea of utilizing the round ligaments for that purpose by shortening them through the inguinal canal. He was soon followed by Olshausen and Kelly, who were the first



to open the abdomen for the permanent correction of backward displacements of the uterus. This gave a great impetus to the surgical treatment of uterine prolapse, the plastic operations on the vagina, hitherto performed for the relief of this condition, proving insufficient without the reposition of the uterus into its normal anteposition. The plastic work had recently been much improved by such men as Hegar, Martin, and particularly Emmet, whose masterful skill in plastic surgery, based upon correct anatomical principles, brought about radical changes in the methods formerly in vogue and whose operations are performed even to-day by many of the leading surgeons with only slight modifications. The fact is that in the enthusiasm for innovations and improvements in abdominal surgery, little attention was given to the minor operations about the vaginal outlet which for a time were sadly neglected until recent years revived the interest in that portion of the pelvic channel.

At the foundation of this Society a lively discussion was in progress regarding the proper treatment of cancer of the uterus. As early as 1878, Freund did a radical abdominal operation for uterine cancer which, however, was soon abandoned on account of the frightful mortality (72 per cent.) and vaginal hysterectomy came gradually into favor as a much safer substitute. Much bitter opposition, however, developed against this operation, especially by men advocating and practising amputation of the cervix by knife and cautery, on the grounds that the results did not justify such dangerous and mutilating operations. In the light of our present knowledge this opposition was not entirely out of place, as statistics have since shown better results and a larger percentage of cures in the hands of such men as Byrne of Brooklyn, Baker, Brown, and others, by their cautery operations performed without any loss of life, than has been obtained by the vaginal hysterectomy as performed at that time. Uterine extirpation per vaginam, at least in carcinoma of the cervix, as ordinarily performed, that is without a thorough removal of the disease focus in the vagina and parametrium, experience has demonstrated as being not much more than a mere palliative operation, and about on a par with the high amputation of the cervix practised at that time by Schroeder and Winter, the latter, however, having in its favor the absence of mortality.

Until the year 1886 when Fitz of Boston published his careful studies and investigations of appendicitis, we possessed very little definite knowledge of that condition. The inflammatory proc-

esses in the right iliac region were spoken of as a typhlitis and perityphlitis, and when more extensive, as peritonitis, and the operative treatment was of course confined to incising the abscesses in this region. Further investigation of this subject was now taken up by the surgeons who, from specimens and the information gained at the operating table, were soon able to formulate a definite pathology of the disease and indicate its rational and proper treatment. We owe to a very large extent the wonderful success in the management of this once justly dreaded affection to some members of this Association; Murphy, Deaver and Morris were unquestionably the prime and acknowledged leaders to whose efforts and activities we are indebted for the rapid advances made in this particular field of surgery.

The postoperative conditions as well as the after-treatment of abdominal sections in the early days of the last quarter of a century, differed very considerably from those of the present time, and the easy, smooth convalescence, almost uniformly observed by the modern and skilled surgeon, was then rather the exception than the rule. The bug-bear was always infection and peritonitis, which in spite of the antiseptic methods then in use, were a common complication and the largest single factor contributing to the death rate. The reason of this may be explained by the fact that antiseptics was then the practice rather than asepsis, and that entirely too much reliance was placed in the germicidal action of the antiseptic drugs employed. Hand-disinfection is at best very difficult and unsatisfactory, and at that time not as well understood as at present, and what is still more important, the rubber glove, the great boon to aseptic surgery, which gives the surgeon absolute confidence in his ability to prevent infections, was unknown.

In addition to this, operations were then performed in acute inflammatory conditions of the pelvis during the greatest activity and virulence of the pathogenic organisms, when everything favored general infection and peritonitis. The free irrigation of the abdominal cavity with sterile water for the purpose of removing the debris and septic material, so generally practised with a view of preventing the dreaded infection, was illusory and harmful, as it had the effect of scattering septic organisms more extensively over the peritoneal cavity and thereby aiding and increasing the disease process. The glass drainage tube then considered indispensable in such cases, though when properly used was helpful and of great benefit, was insufficient and often powerless

in checking the rapid invasion and toxic action of the liberated septic agents.

It is, therefore, not surprising that the mortality in this class of cases was very high and that those which recovered, often after a long, tedious and stormy convalescence, did so with complications of grave wound infections, sinuses, and not rarely fecal fistulæ. These results were, unfortunately, not always confined to the septic cases; they not rarely occurred in the clean and uncomplicated cases, and that in the hands often of the most careful and experienced men. It is no wonder then that the surgeon was constantly on the lookout for trouble of this character and ever ready with his precautions to forestall them by measures considered at that time highly important and very effective. Among these saline laxatives, especially sulphate of magnesia, occupied the most important place and was often administered as early as a few hours after operation, for the purpose of draining the bowels and the peritoneal cavity, thus aiding the elimination of the pathogenic organisms. Opiates in any form were shunned as poison, and their administration regarded little short of criminal, because they tended to mask the symptoms, especially those of peritonitis, and by interfering with peristalsis, locked up the intestinal secretions, thereby greatly lessening the patient's chances of recovery. Those of us who have not personally witnessed it, may at least imagine the suffering of these poor patients who were compelled to drink frequent nauseating doses of salts and who had to pass through this ordeal without any relief, as the surgeon standing at the bedside with a sad and troubled heart did not dare to jeopardize his patient's chances by a merciful dose of morphia. To what extremes the medical man has often wandered, groping his way in the darkness and what sacrifices he has been obliged to make before the much looked for light finally appeared! Not many years before that period, the Alonzo Clark treatment was in general use for peritonitis, which was the exact opposite of that described above. Cathartics were strictly forbidden and opium given in large doses to the point of tolerance, keeping the patient in a condition bordering on semicoma for days, because the rest treatment so successfully used in inflammations elsewhere was expected to accomplish the same good results in the peritoneal cavity. For that reason, complete body rest, with arrest of peristalsis was secured by these extreme doses of opium. At the present time we have arrived at a point about midway



between these two extremes, verifying the old maxim "*In medio stat virtus.*"

Secondary hemorrhage also was a condition of not infrequent occurrence and gave the surgeon many anxious moments during the first twenty-four hours after operation. This was usually caused by a slipping ligature, which the surgeon at this early date had not learned to tie with the security which subsequent experiences gave him. These were sad and trying cases, because when the condition was recognized, relief often came too late. Deaths from hemorrhage were no doubt more common at that time than was generally admitted, because many of these were attributed to shock which in the light of our present knowledge we would unhesitatingly recognize as caused by internal bleeding.

Among the most frequent postoperative complications may be mentioned incisional hernia which then occurred in a considerable percentage of the cases; 10 per cent. is probably not an exaggerated proportion. This was partly due to the frequent deep wound infections, the glass drainage tube and the gauze drain, especially the Miculicz drain which was then not rarely used in the pelvis. It also followed simple operations without infection on account of the careless closure of the abdominal incision which was then invariably closed by through-and-through sutures of silkworm gut; suturing the different layers of the abdominal wound is of more recent date. As a consequence faulty apposition and imperfect union, especially between the fascial layers, frequently resulted with subsequent separation and hernia formation.

Until twenty years ago silk was the only ligature and suturing material in general use in the abdomen. This became frequently infected, resulting in exudate and abscess formation in its immediate vicinity, forming the so-called "stump exudates" which gave rise to many annoying and troublesome symptoms, persisting for months, leaving the patient often in as bad if not worse condition than before operation, and requiring in many cases secondary operations for relief. The substitution of cat-gut for silk has done away almost entirely with this formerly very troublesome complication, so that our younger surgeons have been spared this very unpleasant experience.

Obstetrics has not experienced those revolutionary changes which marked the course of abdominal surgery and gynecology during the last twenty-five years. This may be attributed to

the fact that when the evolution in these departments began, obstetrics was quite a well-developed art and science, considerably in advance of any other branch of medicine. As the leading obstetricians of this time were usually also active gynecologists, the new era brought so many new problems to be solved and worked out that their interests and labors were so entirely absorbed in this new work that obstetrics did not receive the attention this important subject demanded, at least during the earlier part of the period in question. It is not to be understood, however, that obstetrics was not benefited and influenced by the vast developments going on in the other allied departments, because the introduction of antisepsis alone was of vital importance, inasmuch as by it thousands of lives were saved annually. The not uncommon puerperal fever epidemics were stamped out entirely and for all time and not only was the mortality of the puerperal state greatly reduced, but also the morbidity lessened very materially. To the beginning of this period must also be credited Sanger's improved Cesarean section, and the revival of symphysiotomy. During recent years we have witnessed a decided and renewed interest in this so important branch of medicine during which surgical methods have been introduced for the treatment of many obstetrical complications which have taken the place of some of the old conservative methods, especially in eclampsia and placenta previa.

This brief retrospect covering only the most important features will suffice to give those not fully familiar with the situation in abdominal surgery and gynecology at the time of the foundation of this Society, a fairly clear idea of what has been achieved during the last twenty-five years. It will also, to a certain extent at least, picture to them the constant difficulties and anxieties attending the work of those pioneers who were compelled to rely upon their own resources, and whose daily labors were in a field in which neither the experience, advice or assistance from others were available. It was fortunate for the development of abdominal surgery in this country that at this early period, just a few years previous to the organization of this society, the late lamented Joseph Price began his remarkable career, and his clinic commenced to attract attention.

It soon became the Mecca to which the surgeons from every part of the Union flocked who, inspired by his enthusiasm and skill, took up the work in their various spheres with more confidence, adopting the simple and successful methods practised

by this master of technic. There are few of our older surgeons living in the various States of the Union who at some time or another have not been pupils of Joseph Price, and who do not owe much of their early success to his personal instructions. Whatever opinion we may hold of his work in later years, we all must agree that in those days he was a master and a teacher without his equal, and to him abdominal surgeons, at least of this country, owe a debt of gratitude as to no one else.

That abdominal surgery and gynecology will continue on the path of development and progress during the next twenty-five years is certain, but that it will be accompanied by the revolutionary changes experienced during the last quarter of a century is hardly to be expected. Changes of another character, however, may be looked for which may have important bearings on the profession at large and to which I take the privilege to allude very briefly.

Abdominal surgery and gynecology, formerly in the hands of a comparatively few men especially trained in these lines, are rapidly passing the point of specialism and are becoming to a large extent the property of the general practitioner, and in this lurks a danger which we must sooner or later face. It is a highly laudable ambition and one to be encouraged for every member of the profession, especially when starting in his chosen career, to equip himself to the full extent of his ability for the work of relieving suffering humanity in whatever form it may be met, and nobody should criticise the physician who wishes to extend his field of usefulness to any branch of medicine, provided he is fully competent to do so without detriment or injury to his patients. To do good surgery requires an amount of special training and should include an apprenticeship to some master in these surgical specialties, which is available to comparatively few, not to mention a natural aptitude and fitness, indispensable to the successful surgeon. Without these requirements and qualifications our surgical work must of necessity be unsatisfactory and inferior, and often dangerous if not fatal, and, moreover, operations performed without the slightest indication or necessity will be of not rare occurrence because diagnostic skill is even more difficult to acquire than technical ability. Unless some restrictions can be drawn, and this surgical craze, rampant even now, checked, great harm will be done and surgery discredited. Such control seems just as important as that adopted by all states against illegal and unqualified practitioners



and charlatans, or even as the precautions against adulteration of food-stuffs or drugs.

Another danger coincident with increased competition and our commercial age which threatens to dethrone from its high pinnacle of honor and dignity on which the medical profession has been placed from time immemorial and to undermine the public confidence so necessary in the performance of our duties, is commercialism, which in this connection is closely allied, if not synonymous with dishonesty. At present this is most conspicuous in the form of the so-called "fee-splitting," an abuse and a form of dishonesty which must sooner or later, unless promptly checked, become generally known among the laity, when it will disgrace the profession and subject the honest men in it to public suspicion, just as much as the dishonest. Steps should be taken in the various medical societies to stamp and root out this evil which will soon be followed by other abuses and disgraceful actions, if we do not wish to see the name of our loved profession stained and besmirched and the self-sacrificing labors of the surgeon made more difficult and his honored position in the public, considerably lowered. The work of eradicating these dangers, which I am sure are not imaginary or visionary, but are in actual existence, and have already taken quite a serious aspect in many communities, must be faced at once and proper measures considered in the most influential medical societies for the elimination of all such elements so detrimental for the welfare and future usefulness of our great profession.

In conclusion, permit me to express to you my appreciation of the high honor conferred upon me in choosing me your presiding officer, especially for this year of our Silver Anniversary, which is one of great importance in the history of the Association. I am fully conscious of my failings and the lack of those qualifications so highly desired in a presiding officer, but as you elected me without my solicitation and even without my knowledge, it is only fair that you assume the responsibility for this act, and I can only ask you to be patient and indulgent with my shortcomings.

714 JENKINS BUILDING.

## TRANSACTIONS OF THE AMERICAN ASSOCIATION OF OBSTETRI- CIANS AND GYNECOLOGISTS.

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*Proceedings of the Twenty-fifth Annual Meeting, held at  
Toledo, Ohio, September 17, 18 and 19, 1912.*

*The President.* X. O. WERDER, M. D., *in the chair.*

After the usual addresses of welcome the scientific session opened with the reading of a paper on

### CESAREAN SECTION.<sup>1</sup>

(POINTS OF INTEREST IN A SERIES OF SEVEN CASES.)

BY

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THE comparatively large number of indications included in this small series of cases, and the hope that the discussion of the interesting points in each case will prove beneficial, is my excuse for presenting this short paper on an ever interesting subject.

CASE I.—Mrs. B., Bohemian, age twenty-four, full term. Was called in September, 1907, to this case by the family physician, an exceptionally competent man, who had made repeated attempts at delivery with the Elliot forceps, but without success. The Tarnier forceps were then applied but these, too, proved ineffectual and the patient was transferred to Harper Hospital, abdominal Cesarean section performed, and a large male child delivered. During the puerperium the mother developed a slight fever, varying between 99° and 102° F., for about five days. Other than this, the recovery of both mother and child was uneventful.

The point of interest in this case is that the uterus was not removed at the time of operation, notwithstanding the fact that

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

repeated attempts at delivery had been made before the patient was brought to the hospital. This, I am aware, is contrary to the teachings of many authorities on this subject, but it seems to the writer that, given the case of a young woman of good resistance who has been examined repeatedly by a careful physician, and has even been subjected to repeated attempts at delivery with the forceps, we are not justified in removing the uterus, and thus depriving her of the hope of future childbearing.

The pelvic measurements in this cases were as follows:

Interspinous .....	22.5 cm.
Intercristal .....	27.5 cm.
Intertrochanteric .....	30 cm.
Anteroposterior .....	17.5 cm.

CASE II.—Mrs. M., American, age thirty-seven.

*Indications.*—Justominor pelvis.

*Diameters:*

Interspinous .....	21.5 cm.
Intercristal .....	23.5 cm.
Intertrochanteric .....	27.5 cm.
Anteroposterior .....	17.5 cm.

The points of interest in this case are, the history and the excellent results attendant upon the adoption and carrying out of the modern approved method of treatment in these cases, namely, operation by election.

*History.*—*First child* several years ago; difficult instrumental delivery, two physicians in attendance; results, dead child and extensive lacerations.

*Second child* delivered by the writer. Difficult instrumental delivery, small female, baby living, and, I am glad to say, still alive after eight years.

*Third Pregnancy.*—Patient neglected to notify me of her condition until she was in labor. The child was large and the head would not engage satisfactorily. Called another physician and after repeated unsuccessful attempts at delivery performed podalic version and delivered the patient of a dead child. In other words, I sacrificed the child in trying to deliver it, instead of transferring the patient to a good hospital and delivering her by abdominal Cesarean section, as I would now do. I informed the patient that if she became pregnant again she must go to the hospital and submit to whatever form of delivery was deemed best. Within a year she again became pregnant and I had her removed to the Womans' Hospital and operated at the first onset of labor pains. Delivered her of a fine boy baby, both making uneventful recoveries.



CASE III.—Mrs. A., Bohemian, age thirty.

*Indications.*—Flat rachitic pelvis and prolapsed cord.

*Diameters:*

Interspinous .....	27.5 cm.
Intercristal .....	30 cm.
Anteroposterior .....	20 cm.

This patient presented quite a marked lordosis and had been delivered once before by abdominal Cesarean section. One would be led to surmise that a patient with so large a pelvis could be easily delivered, but the true state of affairs was revealed at operation, when it was found that the promontory of the sacrum projected far out over the superior strait, thus preventing engagement of the head.

Another interesting point about this case was the fact that no scar could be found in the uterus following the former delivery.

This patient's husband took it upon himself to remove her from the hospital on the eighth day, and on visiting her at her home on the tenth day, found her attending to her household duties. The lesson taught by this case is that the external measurements are not always to be relied upon, especially where a lordosis is present.

CASE IV.—Mrs. M., age forty-two, multipara.

*Indication.*—Placenta previa centralis.

Saw this patient in January, 1910. She was then within two weeks of term and had been flowing quite profusely for two or three days, so much, indeed, that she was markedly anemic. The placenta was situated almost directly over the center of the cervical canal.

Fearing that an attempt at delivery by detaching the placenta would result in the death of the child, I suggested abdominal Cesarean section. The patient was very desirous of having a living child and readily consented to the operation, which was done as soon as she could be transferred to the hospital.

She made an apparently uneventful recovery, but on removing the abdominal dressing on the tenth day it was found that the abdominal incision had failed to unite, partly because of a mass of omentum which presented just beneath the skin, and partly, as I suppose, because of poor nourishment in the tissues of the abdominal wall. Removal of the omental mass, freshening of the margins of the incision and new suturing resulted in a complete recovery, and the mother is happy in the possession of a living child, which good result, I fear, might not have accrued had I adopted any other method of delivery.

Is placenta previa centralis an indication for abdominal Cesarean section? The writer is firmly convinced that it is, believing that the dangers attendant upon this operation are

far overbalanced by perforation of the placenta turning and bringing down a leg, which is the routine procedure in these cases.

CASE V.—Mrs. B., primipara, age thirty.

Saw this patient in June, 1910, in consultation with her family physician, who, with a neighboring practitioner, had made repeated attempts at delivery with the forceps, without success. On bimanual examination a large fibroid tumor occupying the lower uterine segment could readily be palpated. The patient was transferred to the hospital and delivered per abdominal Cesarean section of a dead child, which had evidently been sacrificed in the ill-advised attempts at delivery with the forceps. The fibroid was of the interstitial variety and occupied so much of the lower uterine segment that supravaginal hysterectomy was deemed advisable. This was done, and the patient made an uninterrupted recovery.

The question of the advisability of the removal of the uterus in such cases as this is one which I sincerely hope will not be overlooked in the discussion, as the writer has personal knowledge of the complete disappearance of such growths following pregnancy and parturition in at least two cases. The sad commentary on this case is that the child might have been saved by an early recognition of the condition and prompt abdominal Cesarean section.

CASE VI.—Primipara, age thirty-seven.

*Indications.*—Fibroid tumor.

Married eleven years. Consulted me in November, 1910, pregnant four months. On bimanual examination a good-sized fibroid tumor could be palpated occupying the lower uterine segment, filling the pelvis to within an inch of the posterior aspect of the pubes. The growth was firm and immovable.

Thinking that possibly we had to deal with a pedunculated fibroid which might be dislodged later in the gestation, I advised the patient to report from time to time, which she did. At full term, however, no change could be made in the position of the growth, and the patient was advised to hold herself in readiness to enter the hospital for abdominal Cesarean section on the onset of labor pains.

At the end of ten days after the completion of term, no signs of labor having developed, I advised the patient to enter the hospital in the evening and be operated the following morning. This she consented to, and on seeing her that evening she remarked that she had not felt any fetal movements since morning. Careful stethoscopic examination revealed the fact that the child had died during the day.

At operation the following morning a condition very much like that in Case V was found, although the tumor did not involve quite so much of the uterine wall.

This couple was very anxious to have a child and I decided to leave the uterus, with the hope that the woman might be more fortunate at some future time. In early June of this year her husband informed me that she was again pregnant, having missed three periods. This, however, proved to be untrue, for on examination in my office, August 15, I was surprised to find not only that she was not pregnant at all, but that the fibroid tumor had entirely disappeared.

The queries which present themselves in this case are:

1. What caused the death of the child?
2. Why had the patient ceased menstruating?

CASE VII.—Mrs. S., primipara, age thirty.

*Indications.*—Justominor pelvis.

*Diameters:*

Interspinous .....	22.5 cm.
Intercristal .....	25 cm.
Intertrochanteric .....	28.5 cm.
Anteroposterior .....	17.5 cm.

Interest in this case centers in the fact that the patient did not develop labor pains for two weeks after term.

The Walcher position was not effectual, and abdominal Cesarean section was resorted to without any attempts at forceps delivery.

The results were ideal, both mother and child making perfect recoveries.

In conclusion the writer would strongly advocate a more frequent adoption of this operation and would include impacted face presentations among the indications.

506 WASHINGTON ARCADE.

## CESAREAN SECTION. TECHNIC OF THE OPERATION BY THE SMALL MEDIAN INCISION ABOVE THE UMBILICUS, WITH A SUMMARY OF CASES.<sup>1</sup>

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In reviewing the present-day abdominal Cesarean section, several considerations impress themselves upon our attention. We note the large and rapidly increasing number of these operations which are being performed by many different surgeons.

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists, at Toledo, Ohio, September 17-19, 1912.



The results which they are able to report are cause for congratulation. Despite the broader scope and the greatly increased number of pathological conditions complicating labor which are now considered indications for the performance of this operation, the maternal mortality has been reduced in a comparatively few years from one which was almost prohibitive, until at the present time it is the concensus of opinion of most operators and writers that not more than 2 per cent. of the mothers, in ordinarily favorable cases, fail to survive Cesarean section, and that there has been great and progressive improvement in this respect in all cases operated upon, the favorable and unfavorable. This is also true in regard to the fetal mortality.

To-day it is not uncommon to meet the reports of long series of consecutive Cesarean operations without any maternal or fetal deaths. The number of cases, especially in hospital practice, which pass through an uncomplicated puerperium and are able to leave the hospital in good condition with a healthy child on the twelfth to the fifteenth and occasionally on the tenth day following this operation is increasing. According to our observations and experience, and we believe that this does not differ materially from that of a considerable number of surgeons, there is yet too high a percentage of morbidity following this operation, ranging from comparatively slight complications of short duration to those in which the life of the mother is in jeopardy for a considerable time and her convalescence is prolonged unduly, although she ultimately recovers. It is possible, we believe, and it should be our endeavor to make improvement along this line and also more infants who are born alive should be made to survive.

From the nature of these cases and from the condition of some at the time when they first come under our care, we cannot altogether avoid complications following this method of delivery. If we are always successful in doing this, it is a fair suggestion that we have excluded from our list some patients who are entitled to and should be delivered by Cesarean section. By all means let us keep up and practise those methods of obstetric procedure which have stood the test of time and which have been helpful long before radical surgical procedures were available, because they were either unknown or were formerly too dangerous to be employed. But where these methods prove inadequate let us not be slow to give such patient the benefits which have been brought about by the progress in surgical technic. There is little danger that the experienced surgeon will perform Cesarean

section unnecessarily. We are positive that many lives of mothers and infants are lost each year and many others are left more or less permanent physical wrecks who could have been saved by the timely employment of Cesarean section, and were it necessary we could recite individual cases which have come under our personal observation in convincing numbers to sustain this view.

This operation has earned something better than to be a last resort in difficult or impossible deliveries through the pelvis. It should be the operation of choice in more cases. For both mother and child, the immediate and ultimate results are better and the dangers not so great as in many of the forceps, versions, and accouchement forcé deliveries; it is a much more surgical procedure than any of these operations.

At the meeting of this Association in 1910, the writer reported the results of seventy-eight Cesarean sections which he had performed; briefly they were as follows:

Number of mothers who survived.....	65	....	83.33 per cent.	
Number of mothers who died.....	13	....	16.67 per cent.	
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Total.....	78			
Number of children who survived.....	64	....	80	per cent.
Number of children who died.....	11	....	13.75	per cent.
Number of children still-born.....	5	....	6.25	per cent.
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Total.....	80			

(Two cases of twins.)

Since that time the writer had performed sixty-nine Cesarean sections with the following results:

Number of mothers who survived.....	65	....	94.21 per cent.	
Number of mothers who died.....	4	....	5.79 per cent.	
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Total.....	69			
Number of children delivered.....	70	(Twins once.)		
Number of children who survived.....	62	....	88.57 per cent.	
Number of children still-born.....	5	....	7.14 per cent.	
Number of children born alive but died				
before leaving hospital.....	3	....	4.29 per cent.	
Total fetal mortality.....	11	....	15.71 per cent.	

The cause of death in the case of the four mothers who died was eclampsia in two cases. They were in deep coma upon admission and were having repeated convulsions never regaining consciousness. There was almost total suppression of urine. Both died the first day after delivery but their infants survived.

One case was that of central placenta previa, antepartum hemorrhage, midwife examinations. Patient was much overcome by the heat. Her child was dead upon admission. The fourth fatal case was in a very large primipara who was said to have been in labor two days and private physicians had attempted high forceps. The pelvic bones were large and thick and there was well-marked flattening of the pelvis. The fetus was dead upon admission; it was very large, weighing slightly over 12 pounds when delivered. The head was high above the pelvic inlet and the uterus was so tonically contracted that the fetus was held as in a vise. In this case craniotomy would have been a most difficult and long operation, and we believe quite as dangerous as that by the abdominal route. This patient died on the fourth day from general staphylococcic infection.

In the four fatal cases in this series we are confident that the operation had no bearing upon the final outcome. They would have died whatever the method of delivery had been, or if they had remained undelivered. Out of four desperate cases we were able to save the two children which had not already died before admission to the hospital.

In the first series of seventy-eight operations the maternal mortality is 16.67 per cent. The fetal mortality in eighty children thus delivered is 20 per cent.

In the second series of sixty-nine operations the maternal mortality is 5.79 per cent. The fetal mortality in seventy children thus delivered is 11.43 per cent. Or in the total number of 147 operations the maternal mortality is 11.40 per cent. Of the total number of children thus delivered, 150 (twins three times) the fetal mortality is 16 per cent. In 114 of these cases, some form of contraction of the bony pelvis was either partly or wholly the indication for this operation. Eclampsia was the main indication for fourteen Cesarean sections of which ten mothers survived and four died, a maternal mortality of 28.57 per cent.; maternal recovery 71.43 per cent. Sixteen children were delivered from these fourteen cases (twins twice) and eleven children survived, giving a fetal mortality of 31.2 per cent. Three of these children were still-born (twins once). Sixty per cent. of the fetal mortality were still-births, killed by the eclamptic toxemia before operation was undertaken; fetal recovery 68.8 per cent.

Of the four eclamptic mothers who died, one (No. 48) had been in the hospital for several days under treatment and observation.



She had one convulsion, was delivered of twins who lived, by Cesarean section, within an hour after her convulsion and she died on the operating-table just as the operation was finished, probably from cerebral hemorrhage. Two others were emergency ambulance cases, in constant coma and repeated convulsions, almost complete anuria; such urine as was obtained was nearly black in color and of syrupy consistency. Each died within the first twenty-four hours. Their infants lived (Nos. 91 and 132). The fourth case (No. 64) died on the second day. Her child, which was slightly premature and feeble died on the twenty-third day. None of these women were in labor. Twelve were pregnant the first time, one the second and one the third time. Tonic contraction of the uterus was the main indication for this operation in four cases. Prolapse of the umbilical cord with live children and undilated cervix in two cases. After ventral suspension or fixation of the uterus after long labor in four cases. Placenta previa in three cases. Two mothers with their children survived. One child was dead upon admission and the mother died from antepartum hemorrhage, midwife examinations; extreme heat and sepsis on the seventeenth day. Accidental hemorrhage—one case—great loss of blood, fetus dead, undilated cervix; the mother survived. Atresia of the vagina complicated by contracted pelvis was the indication twice in the same patient. The mother made a good recovery each time. The first child was small and feeble and died on the second day. The second child lived.

Contracted or otherwise deformed pelvis; eclampsia; placenta previa; accidental hemorrhage; prolapse of the umbilical cord with live child and rigid undilated cervix; tonic uterine contraction; after ventral suspension or fixation of the uterus; new growth, tumors obstructing or preventing dilatation of the birth canal; face impacted with chin posterior; rupture of the uterus with living child; large child with marked disproportion between it and the capacity of the mother's pelvis, regardless of measurements; mothers about to die from any cause, fetus alive; performing an antemortem rather than a postmortem operation wholly in the interest of the child; in the case of women who give histories of repeated vaginal deliveries, craniotomies, high forceps, induction of premature labor and yet have no child; these in the main, in well-considered cases, have been our indications for performing Cesarean section.

Shall we sterilize women at the time Cesarean section is performed? is a question which comes up repeatedly.

In the author's first paper upon this operation (*Lying-in Hospital Bulletin*, December, 1905), this statement appears: "Each operator must determine for himself whether it is wise or right to do an oophorectomy, a hysterectomy, or to otherwise sterilize these cases. The time does not seem opportune, nor the condition of the tissues favorable for such interference. Patients withstand repeated Cesarean operations now with infinitely less shock and traumatic injury and subsequent invalidism, than is experienced in one difficult high forceps operation." Experience confirms our belief in this. We do not sterilize these women, except in rare instances and for good and well-considered reasons. This has always been the teaching and practice in the Lying-in Hospital.

In the 147 Cesarean sections here reported we have sterilized one woman at the time of her second Cesarean section, because she had ruptured her uterus at the thinned lower left anterior uterine segment after long labor before reporting for treatment. The scar of the previous Cesarean wound in the uterus was intact, a living child was secured and the rent in the uterus sutured, the tubes were ligated, cut across and the uterine ends sutured over with peritoneum. Mother and child made a good recovery.

A second case who had already had four Cesarean sections, the first two by other operators, by the long abdominal incision and delivery of the uterus from the abdomen, so that at her third operation we found the uterus rather firmly adherent to the abdominal wall to the left, partly above and partly below the umbilicus, and we found, upon opening the abdomen for the fifth Cesarean section, there had been an increase in the long loose adhesions in the omentum and about the intestines, since her fourth Cesarean section to such an extent that sterilization was advisable. After delivery of the child and closure of the uterus we removed a section from the left tube, ligated it and sutured peritoneum over the ends. The right tube could not be readily reached because of adhesions without endangering the uterine wound. Now, after three years, this woman awaits a sixth Cesarean section, at which time the right tube will be closed.

#### REPEATED CESAREAN SECTION.

In our series we have preformed this operation upon patients who have already been delivered by Cesarean section one or more times, in twenty-six instances as follows:

Second Cesarean section . . . . .	17
Third Cesarean section . . . . .	7
Fourth Cesarean section . . . . .	1
Fifth Cesarean section . . . . .	1
All of the children lived.	
Three of the mothers died.	

CASE X.—Second Cesarean. First in another hospital. Negress. Specific vaginitis. Long in labor. Attempted forceps delivery before admission. Rachitic pelvis. Died of sepsis fourth day. Child lived.

CASE XXXIX.—Third Cesarean. Generally contracted pelvis. Small frail woman. Atonic uterus. Hemorrhage and shock at time of operation. Persistent slow bleeding. Died second day from shock and hemorrhage. Child lived.

CASE LIV.—Second Cesarean. Just minor pelvis. Twelfth day postpartum, discharge of pus from uterus and vagina, which showed many colon bacilli. No fever or other unfavorable symptoms at the time. Allowed to leave the hospital in apparently good condition of the fifteenth day. Two weeks later was readmitted with abscess between uterus and abdominal wall. Necrotic uterus removed. Patient died from sepsis the following day. Her child survived.

The preparation of the patient for this operation is that which is employed for any laparotomy. As a precaution against uterine atony and hemorrhage,  $1\frac{1}{2}$  dram of ergot or ergotole is injected deep into the muscles half an hour before operating.

#### THE OPERATION.

The operation advocated is as follows:

The abdomen is opened by a median incision 8 to 10 centimeters long from above down to the umbilicus. One or two gauze pads wet in warm normal salt solution are placed in the abdomen above the fundus of the uterus to hold back omentum and intestines. Often the uterus is found twisted upon its long axis, usually toward the right side. An assistant standing beside the patient opposite the operator makes pressure with his hands outside against the side walls of the abdomen, rotating the uterus so that its anterior wall looks directly forward and so regulating his pressure that the uterus is held well up to the abdominal opening until it is emptied of its contents—child, placenta and membranes—and until several of the deep sutures are in place and tied. This is in no sense a maneuver to control hemorrhage. The uterus is then carefully opened with a scalpel so as to retain the membranes intact, by an incision a little longer than the



abdominal opening in the midanterior surface of the uterus from just below the fundus downward. If the placenta is found beneath this wound, a not infrequent occurrence, it should be pushed aside or torn through and with the hand in the uterus, the membranes should be separated from the uterine wall while they are yet distended. Neglect of this precaution often means that they must be removed later piecemeal, sometimes with much difficulty and delay, after the child is delivered and retraction and contraction have begun, and at the time when dangerous uterine hemorrhage is most likely to occur.

The anterior thigh of the child, or the one which is most readily found, is grasped and delivered and breech extraction is done, turning the child after delivery of the shoulders, so that it faces toward the mother's face. Then with the middle and index fingers of the right hand astride its neck and with the same fingers of the left hand in its mouth, making traction on its lower jaw, the head is carefully delivered so that there is no sudden jolting or lacerating of the uterus in its delivery. An assistant stands ready with two long clamps in which he grasps the umbilical cord. The cord is cut between the clamps and the child is taken away to have respiration established, preferably into an adjoining room, so that the operating staff's attention may be given entirely to the mother. We now hook two fingers of the left hand into the uterus at its upper angle and place and tie the upper deep suture leaving the ends long; this is repeated at the lower angle of the wound and then with the right hand in the uterus, the placenta, membranes and clots are removed. The first assistant now discontinues abdominal pressure and holds the uterus up to but not out of the abdominal opening by the long ends of the sutures already in place. The uterine wound is closed by two layers of sutures. The deep layer is of No. 2 chromic gut, interrupted and about 1 centimeter apart passed through the uterine peritoneum, close to its cut edge, well out into the muscle and down to but not through the endometrium and out in reverse order on the opposite side. A double turn is taken in the first knot which will then maintain its position without the necessity of its being held by a forceps in the hands of an assistant at the risk of cutting or weakening an important suture with the forceps. The suture is drawn tight enough to bring the edges of the uterine wall into accurate apposition, yet avoiding tension which would blanch and constrict the tissues. They are tied in three knots and cut short to the knot. The entrance and exit of the deep

sutures are close to the cut edge of the uterine peritoneum and the short ends of these sutures render it more easy to completely bury them by the next layer which is a continuous suture of No. 1 chromic gut. Beginning at the lower angle of the uterine wound this suture is inserted and tied and the knot is covered by folding the peritoneum over it with subsequent stitches, passing the needle well outside of the tissue included in the deep layer of sutures and parallel to the line of uterine incision, peritoneum and some uterine muscle are caught up, alternately one side and then the other folding them over and completely burying the deep layer, much after the manner of the Cushing stitch in closure of intestinal wounds, leaving no raw surface, sutures or knot ends exposed and thus reducing to a minimum the chances of subsequent adhesions of adjacent tissues to the uterine wound. The deep interrupted suture holds the two faces of the uterine wound in apposition through the whole depth of the wound. If any interrupted suture gives way it affects only the tissue held by that one suture. If a continuous suture gives way at one point, its force is weakened throughout its entire length. Every precaution should be taken to avoid adhesions and to secure strong, firm union of the uterine wound so that the uterus may involute normally and take its position in the pelvis with its mobility unrestricted by adhesions and so that in the event of subsequent pregnancy the uterine scar will not rupture.

The pads are removed and the abdominal wound is closed in three layers. Dry sterile gauze pads are held in place by a snug adhesive strap across the abdominal wound which is an added support to the abdominal sutures. Elsewhere the dressings and binders are loose, so that the uterus, which is now in the lower part of the abdomen in the position occupied by a uterus after normal labor, may have free movement, avoiding the compression of the abdominal wall against the uterine wall and fixing the uterus at the risk of adhesions between the two as was the case where the tight abdominal binder was employed. The uterus is not delivered from the abdomen at any time. The patient is placed in bed with the head of the bed elevated to favor drainage and descent of the uterus. In the uncomplicated case she suffers the pain and discomfort common to laparotomies for other causes but not more. Morphine in 1/8 grain doses is given by hypodermic injection as heeded and the abdominal distention is relieved by a retained rectal tube or by a saline irrigation. Usually the mother nurses her child and at the end of forty-eight

hours she is treated as a normal delivery. On the eighth day postpartum, she sits up in a chair and by the twelfth day she is ready to leave the hospital. Several of our patients have insisted upon going home on the tenth day, while others who were ready to go home on the twelfth day, for one cause or another, found it inconvenient to leave at that time, or else they lived at a distance and they were advised not to attempt to travel so soon. In the uninfected cases, the blood and liquor amnii which finds its way into the peritoneal cavity does no harm and no great effort is made to remove it.

*We find the following advantages in the use of the small median incision entirely above the umbilicus.*

There is no danger of adhesions between the uterine and the abdominal wounds, and the uterus is therefore allowed to involute normally and take up its position in the pelvis without restricted mobility.

In the midline the abdominal wall is very thin; no important structures are divided and the tissues are quite elastic so that a small opening is all that is necessary for the delivery of the child. The small abdominal opening offers much less chance for the escape of intestine and omentum and less opportunity and necessity to handle the abdominal contents. Located above the umbilicus there is much less probability of the subsequent occurrence of hernia, through the cicatrix, for it is above the most depended part of the abdomen which is subjected to the greatest strain when the patient is in the upright position and more support is given at this point by the recti muscles as they tend to come together toward their upper attachments.

While we have not had an opportunity to examine all of the patients upon whom we have performed this method of Cesarean section, there is yet a considerable number who return for subsequent delivery in this way—or for other causes—and thus far we have not seen hernia in any of our patients.

#### HEMORRHAGE.

Hemorrhage has always been considered one of the great dangers of this operation. While it is a real danger, it has, we believe, been overrated. In many instances there is less actual loss of blood than during a normal labor. Good uterine contraction is a great safeguard, which is favored by the injection of ergot, before mentioned. There are two possible sites from which we may look for hemorrhage—the cut surfaces of the uterine wall



and the field of the placenta. That from the uterine wall is readily held in check by digital pressure, or very occasionally a clamp and later by the operator's hand and wrist while he is separating the membranes and extracting a foot and then by the pressure of the child during its delivery. After the extraction of the placenta if there is undue bleeding from that source, temporary packing with pads or a sterile towel hold it in check, and then the uterine sutures, which effectually ligate the vessels in the uterine wall, and are our most efficient aids in stimulating uterine contraction. Packing the uterus is rarely necessary and fatal hemorrhage is a very unusual outcome.

#### RUPTURE OF THE UTERUS.

This has occurred but once in the uterine scar in our series and then only after prolonged labor. No symptoms were produced and only a small opening was made. The mother and child made a quick recovery. One other case of prolonged labor in labor subsequent to Cesarean section ruptured the thinned lower uterine segment but mother and child recovered. The scar from the first Cesarean was strong and intact. It is a danger which we should keep in mind and take great pains in closing the uterus and securing accurate apposition of the cut edges of the uterus so that a strong thick scar may form.

The accompanying table gives in consecutive order many details of our whole series of this operation.

Case No.	Conf. No.	Date of admission	Date of confinement	Diagnosis	Indication	Result, child	Day of discharge	Remarks	Para
1	21,259	Nov. 19, 1900	Jan. 23, 1901	Vertex L. O. A.	Rachitic dwarf	Lived.	36th	Operation in tenement.	I
2	22,752	Aug. 18, 1901	Aug. 18, 1901	Vertex L. O. A.	Flattened, generally contracted pelvis; bicorn. uterus.	Stillbirth.	43d	Operation in tenement. In care of midwife two days. High forceps attempted by private physicians.	I
3	23,369	Aug. 10, 1901	Nov. 6, 1901	Vertex.	Generally contr., prolonged labor (midwife).	Died 3d day	22 hrs., died.	Sepsis; suppression of urine. Operation in tenement. Last case—uterus delivered — from abdomen.	I
4	2,973	July 20, 1903	Aug. 12, 1903	Vertex L. O. A.	Rachitic pelvis.	Lived.	38th	First case in which uterus was not delivered.	I
5	3,093	Sep. 15, 1903	Sep. 22, 1903	Vertex L. O. A.	Funnel pelvis.	Lived.	34th	.....	III
6	3,168	Sep. 17, 1903	Oct. 13, 1903	Vertex L. O. A.	Ankylosis right hip, Naegele pelvis.	Lived.	58th	.....	I
7	3,228	Oct. 24, 1903	Nov. 23, 1903	.....	.....	Not viable.	39th	General sarcomatosis; pregnant seventh month. Sarcoma of pelvic and abdominal organs; anasarca. Died at home seventy-sixth day.	I
8	3,383	Nov. 21, 1903	Dec. 18, 1903	Vertex L. O. A.	Rachitic dwarf; marked lordosis.	Lived.	52d	.....	I
9	3,684	Feb. 26, 1904	Feb. 26, 1904	Vertex R. O. A.	Rachitic, oblique.	Lived.	26th	.....	I
10	3,766	Mar. 18, 1904	Mar. 18, 1904	Vertex R. O. A.	Generally contracted pelvis.	Lived.	4th died.	Sepsis; prolonged labor; attempted delivery before admission. Second Cesarean section.	II
11	3,857	Apr. 11, 1904	Apr. 11, 1904	Vertex.	Rachitic pelvis.	Lived.	36th	.....	II
12	4,830	Oct. 19, 1904	Nov. 20, 1904	Vertex L. O. A.	Rachitic pelvis; same as No. 4 (2973).	Lived.	29th	First case with median incision wholly above umbilicus.	III

Case No.	Conf. No.	Date of admission	Date of confinement	Diagnosis	Indication	Result, child	Day of discharge	Remarks	Para
13	4,867	Nov. 20, 1904	Nov. 29, 1904	Vertex R. O. A.	Naegele pelvis; right side.	Lived.	19th	Scar 7 cm. long. Sitting up on fourteenth day.	I
14	5,079	Jan. 17, 1905	Jan. 17, 1905	Vertex L. O. A.	Flat pelvis; long labor. Pains terminated by outside doctors.	Died in 53 hrs.	3d died.	General peritonitis; gangrene endometritis; general streptococemia and staphylococemia.	I
15	5,249	Feb. 20, 1905	Feb. 20, 1905	Vertex L. O. A.	Generally contracted pelvis.	Marasmus; died 25th day.	41st	.....	I
16	5,747	May 27, 1905	June 7, 1905	Breech L. S. A.	Double promontory Rachitic pelvis.	Lived.	18th	Before this other operators did uniformly and two Cesareans. Third Cesarean section.	IV
17	5,880	July 23, 1905	July 23, 1905	Vertex.	Carcinoma cervix and vagina.	Lived.	29th	.....	II
18	6,260	July 8, 1905	Sept. 11, 1905	Vertex L. O. A.	Flat pelvis.	Lived.	29th	.....	I
19	6,449	Sep. 28, 1905	Oct. 18, 1905	Vertex R. O. A.	Generally contracted.	Lived.	18th	Second Cesarean. C. S. 6-21-'04. Other operator.	II
20	7,194	Mar. 11, 1906	Mar. 12, 1906	Vertex L. O. A.	Flat, figure 8 pelvis.	Lived.	16th	.....	I
21	7,276	Mar. 27, 1906	Mar. 27, 1906	Face R. M. P.	Obliquely contracted pelvis. Impact of face. Painless uterine contractions.	Marasmus; died 28th day.	36th	Cephalic and podalic versions failed.	I
22	7,391	Apr. 13, 1906	Apr. 14, 1906	Vertex L. O. A.	Rachitic dwarf.	Lived.	25th	.....	I
23	7,398	Apr. 16, 1906	Apr. 16, 1906	Vertex L. O. A.	Contracted pelvis	Lived.	23d	Second Cesarean. C. S. 10-27-'04. Other operator.	IV
24	7,545	May 10, 1906	May 10, 1906	Vertex L. O. A.	Flat pelvis.	Lived.	38th	.....	I



Case No.	Conf. No.	Date of admission	Date of confinement	Diagnosis	Indication	Result, child	Day of discharge	Remarks	Para
25	8,727	Nov. 25, 1906	Nov. 25, 1906	Vertex R. O. T.	Generally contr. pelvis.	Lived.	15th	.....	II
26	8,931	Dec. 25, 1906	Dec. 25, 1906	Vertex L. O. A: twins.	First child delivered in O. P. D. 38, 124. Tonic uterine contractions.	Died.	31st	Version and high forceps attempted. Admitted as ruptured uterus.	IV
27	8,918	Dec. 23, 1906	Dec. 23, 1906	Vertex L. O. A.	Flat, generally contracted.	Lived.	18th	.....	II
28	9,189	Feb. 1, 1907	Feb. 1, 1907	Vertex R. O. P.	High forceps attempted; private doctor. Flat pelvis, long labor.	Died 10th day.	Died 2d	General streptococemia both in mother and child.	I
29	10,100	Apr. 29, 1907	June 16, 1907	Vertex L. O. A.	Second Cesarean. Same as No. 65. Rachitic pelvis.	Lived.	22d	.....	I
30	10,128	May 12, 1907	June 19, 1907	Breech L. S. A.	Rachitic pelvis. Long spines.	Lived.	18th	First Cesarean No. 11 (3857). Second Cesarean section.	IV
31	10,487	Aug. 4, 1907	Aug. 5, 1907	Vertex L. O. A.	Flat justo-minor.	Lived.	34th	.....	II
32	10,499	Aug. 6, 1907	Aug. 6, 1907	Vertex R. O. A.	Flat justo-minor.	Lived.	20th	.....	I
33	10,792	Sep. 10, 1907	Sep. 10, 1907	Vertex L. O. A.	Flat rachitic pelvis.	Lived.	17th	Second Cesarean. First Cesarean. Same as No. 24 (7545).	II
34	10,968	July 19, 1907	Oct. 7, 1907	Vertex R. O. A.	Rachitic dwarf.	Stillbirth.	27th	Cord prolapsed while taking ether for Cesarean.	I
35	11,000	Oct. 13, 1907	Oct. 13, 1907	Vertex R. O. A.	Double promontory. Laterally contracted pelvis.	Lived.	15th	.....	III
36	11,157	Nov. 7, 1907	Nov. 8, 1907	Vertex R. O. A.	Flat pelvis.	Lived.	29th	.....	II
37	11,169	Nov. 10, 1907	Nov. 10, 1907	Vertex L. O. A.	Eclampsia, 9½ mos.	Lived.	17th	Not in labor.	I

Case No.	Conf. No.	Date of admission	Date of confinement	Diagnosis	Indication	Result, child	Day of discharge	Remarks	Para
38	11,258	Nov. 22, 1907	Nov. 23, 1907	Vertex.	Generally con- tracted pelvis.	Lived.	16th	First child died sixth day post-partum. High forceps.	II
39	11,481	Dec. 25, 1907	Dec. 26, 1907	Vertex L. O. A.	Generally con- tracted pelvis.	Lived.	2d, died.	Shock; hemorrhage. Third Cesarean section.	III
40	11,607	Jan. 9, 1908	Jan. 9, 1908	Vertex.	Ruptured uterus. Same as No. 27 (918). 2d C. S.	Lived.	20th	Delayed reporting until long in labor. Second Cesarean.	III
41	11,823	Feb. 5, 1908	Feb. 5, 1908	Vertex.	Impacted in pelvis. Fibroids of uterus.	Lived.	19th	Resection of tubes.	IV
42	11,906	Feb. 15, 1908	Feb. 16, 1908	Breech.	Fourth Cesarean.	Lived.	20th	Fourth Cesarean. Same as No. 16 (5747).	VI
43	12,148	Mar. 17, 1908	Mar. 17, 1908	Vertex.	Not in labor. Eclampsia. Full term. Justo-minor	Lived.	61st	Homeless.	I
44	12,243	Mar. 27, 1908	Mar. 27, 1908	Vertex.	Lobar pneumonia. Moribund.	Died 5th.	Died.	Died fourteen hours after operation.	VI
45	12,249	Mar. 31, 1908	Mar. 31, 1908	Breech L. S. A.	Acute dilatation of stomach. Naegele pelvis.	Lived.	Died.	Anesthesia taken badly. Died thirty minutes after operation.	II
46	12,453	Apr. 29, 1908	Apr. 29, 1908	Vertex L. O. A.	Flat pelvis.	Lived.	Died.	Died fifty-fourth day; septic endometritis.	II
47	12,482	May 1, 1908	May 2, 1908	Breech.	Generally con- tracted.	Lived.	14th	.....	I
48	12,483	Apr. 21, 1908	May 2, 1908	Twins, both ver- tex.	Eclampsia, 9½ mos. Toxemia.	Both lived.	Died.	Died on table. Not in labor.	I
49	12,531	May 8, 1908	May 8, 1908	Vertex L. O. A.	Justo-minor flat.	Lived.	26th	Inspiration pneumonia.	I
50	12,583	May 15, 1908	May 15, 1908	Face R. M. A.	Flat pelvis.	Lived.	16th	.....	I
51	12,661	May 27, 1908	May 28, 1908	Breech L. S. A.	9½ mos. A. P. Eclampsia.	Lived.	31st	.....	I

Case No.	Conf. No.	Date of admission	Date of confinement	Diagnosis	Indication	Result, child	Day of discharge	Remarks	Para
52	12,938	June 28, 1908	June 28, 1908	Vertex L. O. T.	Flattened pelvis; generally contracted.	Lived.	13th	.....	IV
53	14,178	Dec. 9, 1908	Dec. 9, 1908	Vertex L. O. A.	Flat, generally contracted, attempted high forceps.	Lived.	24th	.....	VIII
54	14,565	Jan. 29, 1909	Jan. 30, 1909	Vertex L. O. A.	Justo-minor pelvis.	Lived.	15th, died.	Second Cesarean. Returned to hospital 29th day, mural abscess. Died 39th day.	III
55	14,637	Feb. 10, 1909	Feb. 10, 1909	Vertex R. O. A.	Tumor, probably dermoid.	Lived.	14th	.....	VIII
56	14,731	Feb. 11, 1909	Feb. 20, 1909	Vertex L. O. A.	Flat rachitic pelvis.	Lived.	14th	.....	I
57	15,479	May 19, 1909	June 6, 1909	Vertex.	Neoplasm of cervix.	Died 4th day.	16th	Hemophilia neonatorum.	III
58	15,575	June 12, 1909	June 19, 1909	Vertex R. O. A.	Flat pelvis. Ventral fixation.	Lived.	20th	.....	V
59	16,500	Oct. 31, 1909	Oct. 31, 1909	Vertex L. O. A.	Rachitic pelvis.	Lived.	16th	Same as No. 16 and 42 (5747) 5th Cesarean.	VII
60	16,558	Nov. 4, 1909	Nov. 12, 1909	Vertex R. O. A.	Flat pelvis. Placenta previa marginata.	Lived.	43d	Not in labor. Persistent bleeding.	I
61	16,890	Jan. 4, 1910	Jan. 4, 1910	Vertex L. O. A.	Generally contracted.	Lived.	12th	.....	I
62	16,961	Jan. 12, 1910	Jan. 15, 1910	Vertex R. O. A.	Exostosis back of symphysis.	Lived.	12th	Generally contracted pelvis.	I
63	16,977	Jan. 17, 1910	Jan. 17, 1910	Vertex L. O. A.	Laterally contracted pelvis.	Ch. died 54th day. Atelectasis.	59th	Operation 25th day to cure old umbilical hernia.	III
64	17,107	Feb. 4, 1910.	Feb. 5, 1910	Vertex L. O. A.	Not in labor. Eclampsia. 8 1/2 mos.	Died 23d.	Died 2d.	.....	I



Case No.	Conf. No.	Date of admission	Date of confinement	Diagnosis	Indication	Result, child	Day of discharge	Remarks	Para
65	17,113	Feb. 6, 1910	Feb. 6, 1910	Vertex L. O. A.	Rachitic pelvis.	Lived.	12th	Second Cesarean. Same as No. 29 (10,100).	II
66	17,128	No. 6, 1909	Feb. 10, 1910	Vertex L. O. A.	In labor 48 hrs. Small rachitic pelvis.	Lived.	25th	Becoming exhausted p. 120.	I
67	17,214	Feb. 19, 1910	Feb. 23, 1910	Vertex R. O. A.	9th mo. Not in labor. Justo-milnor pelvis.	Died 18th day.	Died 7 hrs.	Streptococemia; cerebrospinal meningitis.	I
68	17,310	Feb. 26, 1910	Mar. 10, 1910	Vertex R. O. A.	Rachitic dwarf. 2d Cesarean section.	Lived.	12th	Second Cesarean. Same as No. 22 (7391).	II
69	17,493	Mar. 31, 1910	Apr. 5, 1910	Vertex R. O. A.	Rachitic contracted pelvis.	Lived.	12th	First child craniotomy.	II
70	17,514	Apr. 9, 1910	Apr. 9, 1910	Vertex L. O. A.	Rigid cervix. Living child. Not in labor. Belampsia.	Lived.	24th	.....	I
71	17,562	Apr. 18, 1910	Apr. 18, 1910	Vertex R. O. A.	Flat pelvis. 2d C. S.	Lived.	12th	Second Cesarean. Same as No. 35 (11,000).	II
72	17,603	Apr. 20, 1910	Apr. 26, 1910	Both vertex; twins.	Edelpampsia. No sign of fetal life. Twins.	Stillbirths.	19th	.....	I
73	17,792	May 16, 1910	May 16, 1910	Vertex L. O. A.	Contracted pelvis.	Lived.	11th	.....	II
74	17,780	June 1, 1910	June 1, 1910	Vertex R. O. A.	Contracted inlet. Exostosis. Same as No. 56 (12,583)	Lived.	17th	Rupture of uterus through old Cesarean scar. Second Cesarean section.	VIII
75	17,856	June 29, 1910	June 20, 1910	Vertex R. O. A.	Rachitic dwarf.	Lived.	13th	.....	II
76	17,938	July 6, 1910	July 11, 1910	Breech.	Rachitic dwarf. 2d C. S. Same as No. 31 (10,487)	Lived.	15th	.....	III
77	18,101	Aug. 17, 1910	Aug. 18, 1910	Vertex L. O. A.	Long labor. 90 hrs. Rachitic flat pelvis.	Lived.	6th died	Midwife. Septicemia. Streptococemia.	I

Case No.	Conf. No.	Date of admission	Date of confinement	Diagnosis	Indication	Result, child	Day of discharge	Remarks	Para
78	18,109	Aug. 18, 1910	Aug. 18, 1910	Vertex R. O. A.	Contracted pelvis. Atresia of vagina.	Died 2d day.	12th	Hydrannios. In labor ten hours. Child premature.	I
79	18,466	Oct. 21, 1910	Oct. 22, 1910	Vertex L. O. A.	Irregularly contracted pelvis.	Lived.	14th	.....	V
80	18,992	Jan. 28, 1911	Jan. 28, 1911	Vertex R. O. A.	Flat rachitic pelvis.	Lived.	11th	Third Cesarean. Ruptured ectopic. Since second Cesarean section. Same as Nos. 24 and 33.	IV
81	19,001	Jan. 30, 1911	Jan. 30, 1911	Vertex R. O. P.	Gen. contracted pelvis; long labor.	Lived.	14th	.....	I
82	19,029	Feb. 3, 1911	Feb. 3, 1911	Vertex L. O. A.	Eclampsia, 8th mo. Not in labor.	Lived.	27th	.....	I
83	19,148	Feb. 21, 1911	Feb. 28, 1911	Vertex R. O. P.	Funnel pelvis. Slow, dry labor. Tonic contraction.	Stillbirth.	15th	On posterior wall of uterus, broad contracted band.	I
84	19,205	Mar. 5, 1911	Mar. 5, 1911	Vertex R. O. A.	Eclampsia, 8th mo. Not in labor.	Lived.	17th	.....	I
85	19,208	Feb. 8, 1911	Mar. 5, 1911	Vertex L. O. A.	Funnel, generally contracted pelvis.	Lived.	17th	.....	I
86	19,223	Mar. 8, 1911	Mar. 8, 1911	Vertex L. O. A.	Eclampsia, 8th mo. Not in labor.	Lived.	12th	.....	I
87	19,225	Mar. 8, 1911	Mar. 8, 1911	Vertex R. O. P.	Funnel pelvis. Long labor.	Lived.	12th	.....	I
88	19,276	Mar. 17, 1911	Mar. 17, 1911	Vertex L. O. A.	Contracted pelvis. Large child.	Lived.	12th	.....	V
89	19,307	Mar. 21, 1911	Mar. 21, 1911	Vertex L. O. A.	Laterally contracted pelvis.	Lived.	10th	High forceps attempted.	I
90	19,321	Mar. 24, 1911	Mar. 24, 1911	Vertex R. O. P.	Tumor dermoid (?) posterior part of pelvis.	Lived.	16th	Second Cesarean section. Same as No. (14,637).	IX

Case No.	Conf. No.	Date of admission	Date of confinement	Diagnosis	Indication	Result, child	Day of discharge	Remarks	Para
91	19,353	Mar. 30, 1911	Mar. 30, 1911	Vertex L. O. A.	Generally con- tracted pelvis.	Lived.	10th	.....	I
92	19,367	Mar. 31, 1911	Mar. 31, 1911.	Vertex L. O. A.	Eclampsia, 8th mo. Not in labor.	Lived.	Died 1st.	Suppression of urine; repeated convulsions.	I
93	19,582	May 4, 1911	May 4, 1911	Vertex L. O. A.	Funnel pelvis.	Lived.	12th	Two stillbirths; third child lived twenty-four hours. All opera- tive vaginal deliveries.	IV
94	19,586	May 5, 1911	May 5, 1911	Vertex.	Generally con- tracted pelvis.	Lived.	14th	Second Cesarean. Same as No. 61.	II
95	19,617	May 8, 1911	May 8, 1911	Vertex L. O. A.	Rachitic pelvis; narrow outlet.	Lived.	12th	.....	I
96	19,823	June 2, 1911.	June 3, 1911	Vertex R. O. A.	Generally con- tracted pelvis.	Lived.	13th	.....	II
97	19,898	June 14, 1911	June 14, 1911	Vertex R. O. T.	Funnel pelvis; double promon- tory.	Lived.	11th	.....	I
98	19,909	June 16, 1911	June 17, 1911	Vertex R. O. A.	Funnel pelvis; double promon- tor.	Lived.	12th	.....	III
99	19,951	June 4, 1911	June 23, 1911	Vertex L. O. A.	Rachitic pelvis.	Lived.	11th	Third Cesarean. Same as Nos. 29 and 65.	III
100	20,028	July 4, 1911	July 4, 1911	Breech L. S. A.	Placenta previa, central. Midwife exams.	Stillbirth.	Died 17th day.	General sepsis; staphylococcus aureus. A. p. hemorrhage. Heat prostration.	I
101	20,083	July 10, 1911	July 10, 1911	Vertex L. O. T.	Justo-minor pelvis; extended cervix.	Lived.	12th	.....	I
102	20,136	June 14, 1911	July 21, 1911	Vertex L. O. A.	Oblique pelvis; nar- row inlet.	Lived.	16th	Abortion at fourth month; second labor, twins, one lived; third labor, high forceps, child lived twenty-four hours.	IV



Case No.	Conf. No.	Date of admission	Date of confinement	Diagnosis	Indication	Result, child	Day of discharge	Remarks	Para
103	20,180	June 1, 1911	July 26, 1911	Vertex L. O. A.	Naegele pelvis.	Lived.	17th	Remained longer because of operation upon child.	I
104	20,200	July 28, 1911	July 28, 1911	Vertex L. O. A.	Flat. Generally contracted pelvis. Septic.	Lived.	74th	Second Cesarean section. First in another hospital.	II
105	20,677	Oct. 8, 1911	Oct. 10, 1911	Vertex L. O. A.	Contracted pelvis.	Lived.	12th	.....	III
106	20,689	Oct. 9, 1911	Oct. 12, 1911	Breech R. S. A.	Contracted pelvis.	Lived.	12th	.....	I
107	20,764	Oct. 24, 1911	Oct. 25, 1911	Vertex L. O. A.	Contracted pelvis.	Lived.	11th	Second Cesarean. Same as No. 62.	II
108	20,781	Oct. 27, 1911	Oct. 27, 1911	Vertex L. O. A.	Central placenta previa. Hemorrhage.	Lived.	11th	.....	XIV
109	20,792	Oct. 24, 1911	Oct. 30, 1911	Vertex R. O. A.	Dry labor. Tonic uterine contractions.	Lived.	12th	Undilated cervix. Condition of fetus poor.	I
110	20,795	Oct. 30, 1911	Oct. 30, 1911	Vertex R. O. A.	Flat, generally contracted pelvis.	Lived.	13th	.....	VI
111	20,808	Oct. 31, 1911	Oct. 31, 1911	Vertex L. O. A.	Accidental hemorrhage. Undilated cervix.	Stillbirth	12th	Child dead before operation.	XIII
112	20,985	Nov. 26, 1911	Nov. 26, 1911	Breech L. S. A. Twins, Breech R. S. A.	Prolapsed cord. Undilated cervix.	Both lived.	14th	.....	I
113	20,728	Oct. 18, 1911	Oct. 18, 1911	Vertex L. O. A.	Generally contracted pelvis.	Lived.	21st	First child by craniotomy.	II
114	21,037	Nov. 29, 1911	Dec. 2, 1911	Vertex L. O. A.	Funnel pelvis.	Lived.	23d	.....	II
115	21,039	Dec. 2, 1911	Dec. 2, 1911	Vertex R. O. P. to R. O. T.	Flat, generally contracted pelvis.	Lived.	14th	.....	II

Case No.	Conf. No.	Date of admission	Date of confinement	Diagnosis	Indication	Result, child	Day of discharge	Remarks	Para
116	21,101	Dec. 11, 1911	Dec. 12, 1911	Vertex R. O. A.	Contracted pelvis.	Lived.	33d	.....	I
117	21,107	Dec. 12, 1911	Dec. 13, 1911	Vertex L. O. A.	After ventral suspension.	Lived.	12th	Cervix displaced and undilated. Long labor.	XII
118	21,108	Dec. 12, 1911	Dec. 13, 1911	Vertex L. O. A.	Contracted pelvis. Tonic contraction of uterus.	Stillbirth.	Died 4th day. Sepsis.	Long labor. Dead fetus. Attempted high forceps, by private physicians.	I
119	21,146	Dec. 20, 1911	Dec. 20, 1911	Vertex L. O. A.	Atresia of vagina. Contracted pelvis. Undilated cervix.	Lived.	11th	Second Cesarean. Same as No. 78.	II
120	21,148	Dec. 20, 1911	Dec. 20, 1911	Vertex L. O. A.	Contracted pelvis 3 days in labor.	Lived.	10th	.....	III
121	21,209	Dec. 27, 1911	Dec. 28, 1911	Vertex R. O. A.	Contracted pelvis. Long in labor.	Lived.	10th	.....	V
122	21,240	Jan. 2, 1912	Jan. 2, 1912	Vertex L. O. A.	Eclampsia, 9th mo.	Died 8th day.	12th	.....	I
123	21,241	Jan. 1, 1912	Jan. 2, 1912	Vertex R. O. A.	Kyphotic dwarf.	Died 3d day.	19th	Small, feeble child.	I
124	21,244	Jan. 2, 1912	Jan. 3, 1912	Vertex R. O. A.	Justo-minor pelvis.	Lived.	16th	Pubiotomy. Previous labor.	III
125	21,315	Jan. 12, 1912	Jan. 12, 1912	Vertex L. O. A.	Prolapsed cord. Undilated cervix.	Died 15th day. Sepsis.	22d	.....	V
126	21,323	Jan. 12, 1912	Jan. 13, 1912	Vertex L. O. A.	Generally contracted pelvis. Long labor.	Lived.	28th	Floating vertex.	III
127	21,394	Jan. 21, 1912	Jan. 22, 1912	Breech L. S. A.	Funnel pelvis, 21 hrs dry labor.	Lived.	37th	Two stillbirths. No living child.	III
128	21,407	Jan. 24, 1912	Jan. 24, 1912	Vertex L. O. A.	Flat pelvis.	Lived.	12th	Third Cesarean. Same as Nos. 35 and 71.	V
129	21,474	Feb. 2, 1912	Feb. 2, 1912	Vertex R. O. A.	Flat pelvis.	Lived.	11th	.....	V

Case No.	Conf. No.	Date of admission	Date of confinement	Diagnosis	Indication	Result, child	Day of discharge	Remarks	Para
130	21,522	Feb. 6, 1912	Feb. 8, 1912	Vertex L. O. T.	Rachitic. Generally contracted pelvis.	Lived.	13th	.....	I
131	21,821	Mar. 25, 1912	Mar. 25, 1912	Breech R. S. A.	Rachitic dwarf. P. P. Hemorrhage.	Lived.	13th	Third Cesarean. Same as Nos. 22 and 68.	V
132	21,911	Apr. 5, 1912	Apr. 5, 1912	Vertex L. O. A.	Eclampsia. Suppression of urine.	Lived.	Died in 25 hrs.	Constant coma.	II
133	21,966	Apr. 13, 1912	Apr. 13, 1912	Vertex L. O. A.	Funnel pelvis.	Lived.	29th	.....	VI
134	21,987	Apr. 17, 1912	Apr. 17, 1912	Breech R. S. A.	After ventral suspension.	Lived.	26th	Long in labor. Cervix not dilated and displaced upward.	VI
135	22,049	May 1, 1912	May 1, 1912	Vertex L. O. A.	Flat, generally contracted pelvis.	Lived.	13th	.....	II
136	22,059	May 2, 1912	May 2, 1912	Vertex R. O. A.	Contracted pelvis.	Lived.	59th	Mural abscess. General sepsis.	I
137	22,135	May 13, 1912	May 13, 1912	Vertex L. O. A.	Rachitic pelvis.	Lived.	12th	.....	I
138	22,219	May 27, 1912	May 27, 1912	Vertex L. O. A.	Rachitic pelvis.	Lived.	11th	.....	I
139	22,254	May 31, 1912	May 31, 1912	Vertex L. O. A.	Flattened pelvis.	Lived.	11th	.....	I
140	22,283	June 4, 1912	June 4, 1912	Vertex L. O. A.	Flat, generally contracted pelvis.	Lived.	20th	.....	II
141	22,459	June 29, 1912	June 29, 1912	Vertex R. O. A.	Funnel pelvis.	Lived.	11th	.....	III
142	22,509	July 7, 1912	July 7, 1912	Vertex L. O. A.	Generally contracted pelvis.	Lived.	12th	.....	III
143	22,585	July 9, 1912	July 9, 1912	Vertex R. O. A.	Generally contracted pelvis.	Lived.	13th	.....	I
144	22,567	July 16, 1912	July 16, 1912	Vertex R. O. A.	Generally contracted pelvis, especial laterally.	Lived.	6rd	Twenty-four hours dry labor. Septic.	I



Case No.	Conf. No.	Date of admission	Date of confinement	Diagnosis	Indication	Result, child	Day of discharge	Remarks	Para
145	22,643	July 26, 1912	July 26, 1912	Vertex R. O. A.	Eclampsia, 7 1/2 months.	Stillbirth.	40th	Persistent nephritis.	I
146	22,794	Aug. 14, 1912	Aug. 15, 1912	Vertex R. O. A.	Rachitic, generally contracted pelvis.	Lived.	19th	First by version and craniotomy.	II
147	22,866	Aug. 25, 1912	Aug. 25, 1912	Vertex L. O. A.	Rachitic, generally contracted pelvis.	Lived.	12th	First child craniotomy.	II

42 EAST THIRTY-FIFTH STREET.

ACUTE DILATATION OF THE STOMACH FOLLOWING  
CESAREAN SECTION.<sup>1</sup>

BY

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MRS. Sarah S., Russian, age twenty-seven, ii-para, confinement No. 12249, applied on December 7, 1907, at the Lying-In Hospital for care during her pregnancy and confinement. She gave a history of having been confined in 1905 by a private physician who performed craniotomy on her first child and she stated that she was a little more than six months pregnant for the second time at the date of her application.

Examination showed a healthy woman, erect in attitude; height 4 feet 4 inches; weight 160 pounds. No abnormality was found in either heart or lungs. There was no edema and there were no varicose veins in the lower extremities or external genitals. Measuring from the symphysis pubis upward, the uterine fundus was 22 cm., the umbilicus 25 cm., and the tip of the ensiform 43 cm. The circumference of the pelvis was 102 cm. Between the anterior spines the measurement was 24 cm., between the crests, 28 cm. The external diagonal conjugate was 19 cm., the right oblique diameter 23 cm., and left oblique 22.5 cm. The depth of the symphysis was 5 cm. The bony outlet of the pelvis was of medium dimensions. There was an old laceration through the perineum into the rectum and a relaxed vagina. In the cervix there was a clean-cut bilateral laceration almost up to the internal os. The examiner reported that the patient was so sensitive that he was unable to measure the internal diagonal conjugate. The abdomen was slightly pendulous and very fat, so that little could be learned of the presence or position of the fetus by examination through the abdominal wall and the fetal heart and other murmurs were not heard. Urinalysis revealed no abnormality. This patient went to her home and was lost trace of until March 31, 1908, when she was admitted to the writer's service. She stated that her pains began about 4 o'clock that morning at intervals of about one-half hour, gradually increasing in force and frequency until they were about ten minutes apart. The fetal head was in the right hypochondrium, dorsal plane to the left and the fetal heart was 140 and could be heard over the entire left side of the abdomen. There was no engagement of the presenting breech. The external os was obliterated by the old lacerations and the internal os was

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

high up, rigid and would barely admit one finger. The membranes were intact. Five hours after admission uterine contractions had become more forcible and frequent, yet labor had not progressed. As the various examinations had been unsatisfactory, the patient was placed under complete chloroform anesthesia without difficulty and the writer and other examiners found the plane of the symphysis almost vertical, with a well-marked ridge or exostosis back of it. The pubic arch was moderately broad and the front of the sacrum instead of being curved, was straight at its upper end and presented a sharp angle at its lower part with the tip of the sacrum and coccyx coming abruptly forward. The ischial spines were long and convergent. The promontory was high and jutted sharply forward. The side walls of the pelvis approached the midline and the internal diagonal conjugate was 10.5 cm. The true conjugate was so shortened by this promontory, the position of the symphysis and the exostosis back of it and the pelvic inlet so generally contracted that it was impossible to force the presenting breech to engage. The internal os was still a little more than one finger dilated, not dilatable, and dense scar tissue could be felt extending out from it on either side. The membranes were intact, thick and adherent as far as the examining finger could reach. The patient and fetus were still in good condition and immediate Cesarean section was decided upon and performed as soon as the necessary preparations could be made, by the small median incision above the umbilicus. During these preparations, the patient came out from her chloroform narcosis without being any the worse for it. Upon opening the uterus the placenta was found spread out under the wound over the anterior internal surface. It was torn through and the child delivered by internal podalic version and breech extraction after the Smellie-Veit method. The placenta and membranes were removed with some difficulty; the latter was adherent and came away piecemeal. During this time, there was considerable though not serious hemorrhage and the uterus was somewhat relaxed. The patient grew cyanotic and the pulse became feeble and rapid. Ergot was injected deep into the muscles, she was stimulated and responded fairly well to stimulation. A sterile towel was packed into the uterus, being gradually removed as the deep layer of sutures was placed and tied, so that hemorrhage was held well in check and was practically absent when the first layer of sutures was in place. The latter was buried by a continuous Lembert suture and the uterus, well contracted, took its place in the lower abdomen. The pads used to wall back intestines were removed and as preparation was being made to close the abdominal wound, the stomach, which had not been visible before, suddenly appeared under the abdominal opening, with very much dilated and engorged vessels, and so large that it occupied nearly the entire upper part of the abdominal cavity. The patient's condition was alarm-



ing and the house surgeon at once attempted to wash out the stomach by passing a tube through the nostril, but failed to remove any stomach contents or to diminish the size of that organ. In the meantime, the abdomen was quickly closed in three layers and the dressing held in place by a snugly fitting many-tailed bandage. After stimulation, and the cessation of the anesthetic, the patient's condition became better and she was removed to the ward. About twenty minutes later, she became suddenly worse, respiration ceased and could not be started again artificially, though the heart kept on beating a few minutes more, when the patient died. The child lived and was discharged from the Hospital in good condition ten days later. Though a breech presentation with membranes intact and plenty of liquor amnii present, the right side of the head over the parietal region was much compressed and flattened.

There was nothing in the operation itself which should have placed this woman in her perilous condition. It is our present belief that Cesarean section should have been performed hours earlier. The anesthesia was exceptionally badly taken and there was a lack of skill in its administration throughout the operation which we believe had much to do with the final outcome. Ether was changed for chloroform and then back to ether repeatedly, and profound narcosis with stertorous breathing and cyanosis alternated at short intervals with partial anesthesia and great activity of the patient which tended to the embarrassment of the operator and added materially to the difficulty and duration of the operation. We believe that the foregoing conditions were largely chargeable to the crudely conducted anesthesia in the hands of an untrained interne, plus a capital operation, but an operation which of itself has never proved immediately fatal in our experience. We consider this a specific though exaggerated instance of the danger of entrusting the giving of anesthetics to internes who have had little or no training in this very important part of an operation. Whatever the legal status of the trained nurse as anesthetist in various surgical clinics is or in the future may become, we are glad to be able to state that troubles with anesthesia have ceased in the Lying-In Hospital since the plan of giving ether by the open drop method by a specially trained nurse has been adopted. At the time of this operation, acute dilatation of the stomach was a new experience for the writer and he has not met with the condition since.

Mathieu states that this syndrome is brought about by the swallowing of air which dilates the stomach and upper part of

the duodenum to a point where the duodenum is crossed and, in these cases compressed, by the mesenteric artery. Here the dilatation stops abruptly. The distention may be great enough to also close the cardiac orifice of the stomach. The condition arises not only during surgical operations but in purely medical cases and he states that it has been observed in three cases of eclampsia, in convalescents from typhoid fever, cases where exclusive medical measures had been applied, and no anesthetics used. In our own case, the patient had been in very active ineffectual labor from six to eight hours prior to operation. There was no descent of the fetus into the pelvis. The fetal head rested in the region of the duodenum. After delivery it was found to have been compressed on its right side, the side which was posterior. It is probable that some of the pressure which brought about the flattening of the fetal head was exerted upon neighboring structures and the point of pressure did not change as it does in the gradual descent of the fetus into the pelvis in a labor which is progressing. The patient was profoundly narcotized with ether and chloroform and then allowed to come out from her anesthesia enough so that she was very active. This process was repeated several times and in the active intervals she very probably swallowed large quantities of air and mucus. Her resistance was lowered by prolonged labor, by pressure of the hard fetal head in one position, by the operation and especially by the anesthetics. It is our belief that the syndrome of acute dilatation of the stomach would not have occurred had the anesthesia been skillfully conducted. Having in mind the fact that the cardiac orifice of the stomach may be closed in acute dilatation there is some doubt whether the stomach tube ever passed that point in this case, although it was in the hands of an unusually well-trained and competent house surgeon. But the distention of the stomach was in no way diminished. In the eight cases noted by Mathieu in which laparotomy and incision of the dilated stomach was performed, the patients all died. In our own case, in which the abdomen was already open and the stomach tube had failed, gastrotomy would have at least removed the distention of the stomach and might have given relief enough to allow the patient to recover even though the toxic or other causes underlying this condition were not immediately removed.

ACUTE DILATATION OF THE STOMACH.<sup>1</sup>

## REPORT OF A CASE FOLLOWING CESAREAN SECTION.

BY

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(With Chart, 4 Sections.)

ACUTE dilatation of the stomach is associated with a great variety of conditions. It not infrequently follows operative procedures but occurs more frequently in nonsurgical conditions. In an analysis by Laffer of 217 reported cases, it followed an operation in ninety-seven cases only, or in 38.2 per cent of all cases. In a quite careful survey of the literature I have been able to learn of but four other cases following Cesarean section so that I have felt justified in reporting a case together with a few remarks upon the condition in general.

*Report of Case.*—The subject was a young colored girl seventeen years old, illegitimately pregnant at term. She was admitted to the Magee Hospital on February 19, 1912, four days prior to her delivery by Cesarean section on February 23. The following data were secured at the time of her admission:

She is 5 feet 3 inches tall and weighs 100 pounds. With the exception of measles she had none of the diseases of childhood. Menstruation which began in her fourteenth year has always been regular, recurring every twenty-eight days, always profuse, has lasted five days and not painful. She is uncertain as to the date of her last menstruation and does not recall the date of quickening. Her pregnancy has been uneventful; she has had no nausea or vomiting; her appetite and digestion have been good and her bowels regular. She has, however, not increased in weight.

*Physical Examination.*—Thyroid slightly enlarged, heart and lungs normal, liver and spleen not enlarged. There is no edema or varicosities. Nutrition is poor and there are present the usual marks of rickets occurring during childhood, saber shins, curved femurs, rachitic rosary, prominent frontal and parietal eminences, etc. There is also present a moderate lateral curvature of the lumbar spine to the right.

The abdomen is more or less globular in shape, is quite pendu-

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.



lous, the abdominal walls contain little subcutaneous fat, are very tense and the umbilicus protrudes. The uterus lies in the median line with its fundus the breadth of three fingers below the ensiform. The fetus occupies the right occipito-anterior position of a vertex presentation and the head which is well flexed is dipping into the superior strait. The fetal heart sounds are best heard in the right lower quadrant, number 124 per minute and are of excellent quality.

*Pelvic Measurements.*—The interspinous and intercristate diameters are equal and measure 23 cm. each; the bitrochanteric diameter is 27 cm.; the right oblique 20 cm.; the left oblique 20.5 cm.; external conjugate 16 cm.; diagonal conjugate 10 cm.; true conjugate estimated at 8 cm. The outlet measurements are: transverse 8 cm.; anteroposterior 10 cm.; anterior sagittal 5 cm.; posterior sagittal 7 cm.; subpubic angle estimated at between 80 and 85 degrees. The sacrum is flat, the ischial spines are prominent and the coccyx which is directed with its tip markedly anterior, is freely movable. The introitus and vagina are very narrow and the cervix is nulliparous in character with the external os closed.

The diagnosis of a generally contracted, flat rachitic pelvis was made. As it was thought that Cesarean section or pubiotomy might become necessary, instructions were given that no vaginal examinations be made without special permission after the onset of labor. It was, however, considered not unlikely that the patient would deliver herself so that it was decided to let her make a reasonable attempt before interfering.

Labor began at 5 A. M., February 23, but the patient did not report the fact until 9.15 A. M. and in the meantime ate a hearty breakfast. Until 1 P. M. the pains recurred regularly every three to five minutes, were of very good quality and lasted from forty to sixty seconds. The fetal heart sounds were strong and regular and numbered 136 per minute. Vaginal examination at this time showed the cervix fully dilated but not retracted, the membranes were unruptured and with each pain bulged almost to the pelvic floor. The head was still unengaged, there was no moulding and the anterior parietal bone was overriding the symphysis, there being a marked presentation of the posterior parietal bone. As it was now evident that operative interference would be necessary, Cesarean section was decided upon and performed in the usual manner, the uterus being delivered from the abdomen before being incised. The operation was easy but somewhat prolonged because of difficulty in resuscitating the baby which had to be taken over after a time by my first assistant, leaving me with insufficient help. Ether was the anesthetic used. The patient was returned to the ward in good condition about 3.30 P. M. with a pulse of 120 and temperature 98.2° F.

Three hours after the operation the temperature was normal and the pulse 90. At 10 P. M. the pulse and temperature were

each 100. Up until this time there had been no nausea or vomiting. The abdomen was soft but now considerably distended. The temperature and pulse gradually rose until at 3.30 P. M. February 24, or twenty-four hours after the operation, the temperature was 103°F. and the pulse 140. There was marked abdominal distention but there was no tenderness or rigidity. An enema was followed by the expulsion of a small amount of gas but no fecal matter.

The patient unfortunately had a slight bronchitis before the operation which was much exaggerated by the anesthetic. She coughed a great deal and as moist râles were heard over the apex of each lung, pneumonia was feared. The lung condition, however, cleared up nicely at the end of twenty-four hours but the cough persisted for a number of days causing the patient much discomfort and taxing her strength. The abdominal distention was not relieved and rapidly increased until 9 P. M. February 24, or twenty-nine and one-half hours after the operation. At this time the temperature had risen to 103.4°F. and the pulse to 148 and very weak. Peritonitis was feared on account of the rise in temperature, rapid weak pulse, great abdominal distention and the apparently total absence of peristalsis. As stated, pneumonia was suspected and acute dilatation of the stomach was considered possible. The stomach tube was passed and an enormous amount of gas was expelled together with somewhat more than a pint of a light brown fluid with a foul odor. The distention promptly disappeared and the patient was much relieved and improved. It should be stated that twice during the day (Feb. 24) the patient regurgitated small amounts of fluid, not over an ounce or two, at 2 and 7 P. M., the latter therefore just two hours prior to the passage of the tube for the first time. During the next twenty-four hours the stomach was washed out three times. A large amount of gas and a half pint of dark-green fluid, with a very offensive odor, was obtained each time. The patient was seriously ill during the next three days, during which time gastric lavage was done every three hours. There seemed to be no improvement, the temperature ranged between 100° and 103° and the pulse between 120 and 150.

Following each lavage the abdomen was soft, there was never at any time tenderness or rigidity anywhere in the abdomen. Drs. Geo. L. Hays, E. A. Weiss and Clement R. Jones saw the patient with me on several occasions during this time (Feb. 25 to 29) and all were of the opinion that there were no signs of peritonitis but that the case was clearly one of acute gastric dilatation. I mention this because the writers upon this subject are almost all in agreement that the condition is unassociated with a rise in temperature unless complicated by infection and I am aware that this contention will be made in my case.

On February 27, the patient's condition was unchanged and as at each washing the same amount of fluid was secured, 6 to 8 ounces, it was decided to wash out the stomach every two hours

instead of every three hours. The general improvement in the patient's condition was very apparent and at the end of forty-eight hours following the institution of the two-hour washings, the stomach was found empty for the first time, on passing the tube. About this time also flatus was expelled freely by the rectum. Peristalsis was now heard with the stethoscope for the first time and thereafter enemas were followed by the expulsion of large amounts of gas. On March 2 and 3, lavage was done at three-hour intervals but the fluid again accumulated in the stomach, regained its dark color and foul odor and there was again considerable rise in temperature associated with a change for the worse in the patient's general condition. The two-hour intervals were resumed and continued for the next ten days. Recovery was rapid and uninterrupted. Lavage was kept up with gradually decreasing intervals from March 14 until March 29 when it was omitted entirely.

During the first twenty-four hours following the operation the patient voided 49 ounces of urine and the smallest amount voided during any twenty-four hours was 16 ounces which was on the third day of the puerperium, during which time she was at her worst. With the establishment of peristalsis, nutritive enemas containing small amounts of panopeptone were given at regular six-hour intervals. On March 10, it was observed for the first time, that the water used during lavage was not all returned and it was evident that some of it was finding its way into the small intestine. With this discovery, 2 drachms of panopeptone, 2 ounces of water and 5 minims of tincture of nux vomica were put into the stomach through the tube following each lavage and were well borne.

The patient was discharged on April 4 in excellent condition. The baby weighed 6 pounds and 11 ounces at birth and 9 pounds 1 ounce on discharge. It was bottle fed.

Eserine, atropine and strychnia were used freely and in large doses but we were unable at any time to see any diminution in the amount of fluid found in the stomach as the result of their use. It was observed, however, after a time that with each administration of eserine, the pulse became rapid, weak and even irregular, the patient going into collapse. It was discontinued and there was no further trouble. The foot of the bed was elevated to relieve traction upon the mesentery as recommended by a number of authorities. As soon as the diagnosis was made, all fluids were discontinued by mouth and salt solution given freely by the bowel.

In comparing this case with other reported cases, Lafler's exhaustive review of the literature is used as a basis of comparison.

*Age.*—The patient's age, seventeen years, places her in the third decade in the order of frequency, acute dilatation being most frequent between twenty and thirty, next between thirty and forty and third between ten and twenty.

*Time of Onset.*—Symptoms first manifested themselves six



FEB.

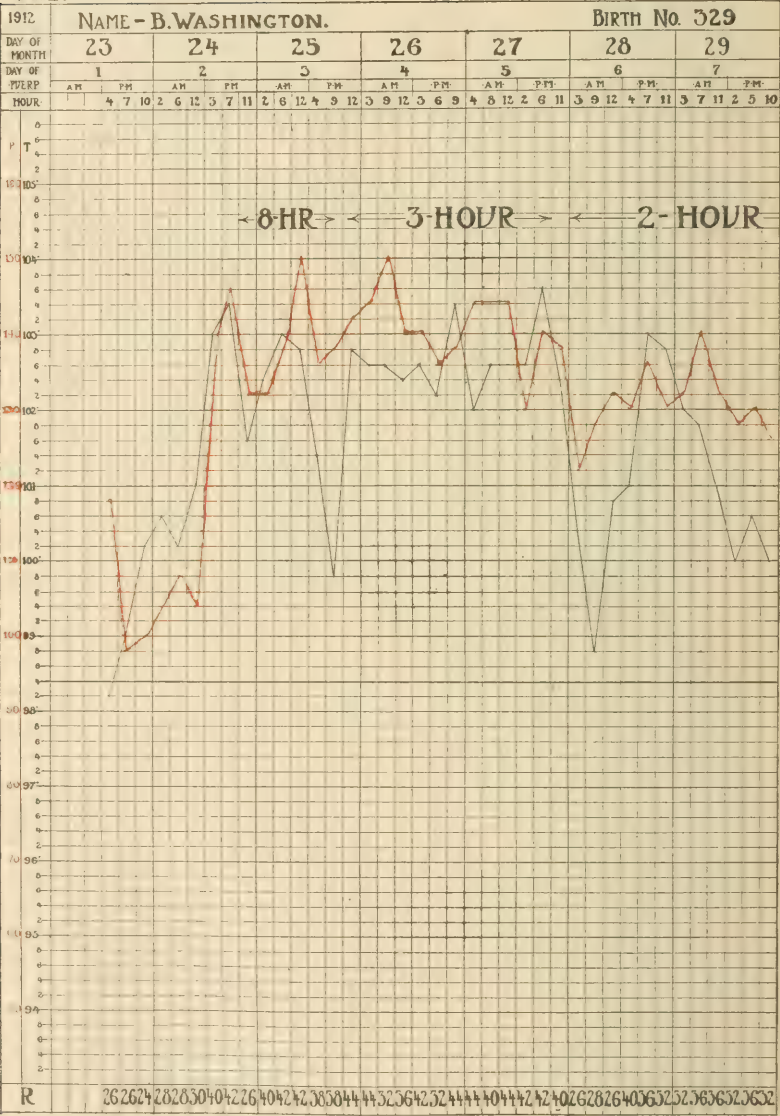


CHART I.

MARCH

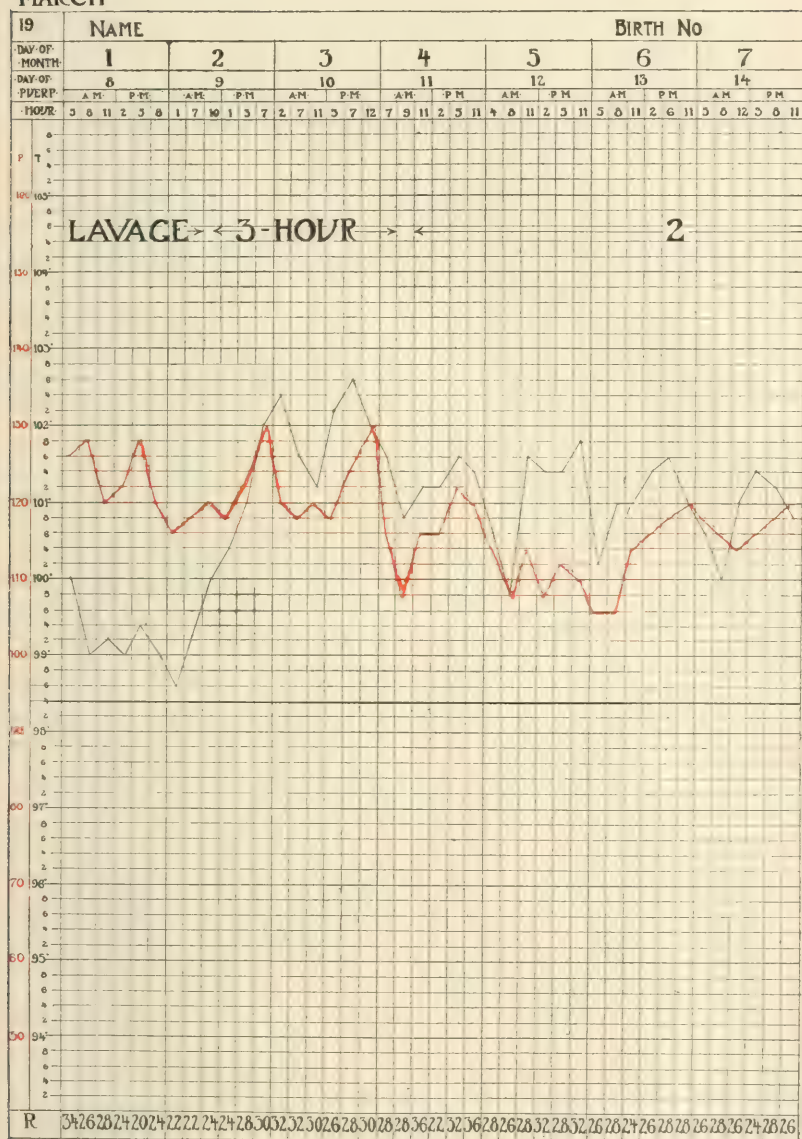


CHART II.

and one-half hours, after the operation and slowly became aggravated. In reported cases the time of onset varies from immediately after operation to two weeks (Robson's and Smith's cases). In one of Tarbert's cases of Cesarean section the stomach had to be washed out before the abdomen could be closed; in the other, symptoms appeared first on the third day following the operation. In Barnard's case of acute dilatation following Cesarean section, symptoms appeared thirty-six hours after the operation. There seems to be no association between the time of onset and the severity of the symptoms.

*Anesthetic.*—Straight open ether was administered in this case throughout the operation. It is frequently stated that a general anesthetic is an important etiological factor. Of twenty cases in which the anesthetic is mentioned, it was chloroform in twelve and ether in eight (Laffer). In one case the administration of ether was preceded by nitrous oxide (Herrick). Bloodgood reported a case occurring after repair of a right-sided inguinal hernia under cocaine. Six months previously this same patient had had a more severe attack following repair of a left-sided inguinal hernia under general anesthesia. Of five obstetrical cases reported, one received a small amount of chloroform during normal delivery. Three others were cases of Cesarean section, in one ether was definitely stated and in the other two it was presumably used. The fifth case, operative delivery for eclampsia, was given chloroform. There may be some connection between anesthesia and the occurrence of acute dilatation of the stomach, but it is not very clear as is evidenced by the fact that the majority of cases occur in patients that have not received an anesthetic.

*Predisposing Causes.*—Unless there was some connection between the ingestion of a hearty breakfast some seven hours prior to the operation, there were no predisposing gastric factors. There was no history of a chronically dilated stomach nor of any other previous stomach trouble. The patient received but moderate amounts of fluid by mouth after recovering from the anesthetic until the diagnosis was made, after which she received none by mouth. There seems to have been no relationship between the pulmonary and gastric conditions since the latter continued in its severest form for days after all physical signs had disappeared from the lungs.

*Symptoms.*—Distention, pain, vomiting, thirst and collapse are the most constant symptoms. In my case some of them only were well marked. Pain was never a marked symptom and at most amounted only to moderate discomfort from distention. While well marked, distention never gave a characteristic stomach outline but was always more or less generalized, promptly disappearing on passing the stomach tube. The puerperal uterus very largely filling the lower abdomen may perhaps in part account for this. Vomiting occurred only twice, at seven and two hours prior to the time when the stomach tube was first



passed. There were only a few ounces of fluid discharged without effort, the vomiting being regurgitant in type. In 90 per cent. of reported cases, vomiting is noted as a prominent and early symptom. Cases in which vomiting is slight or absent altogether, are usually of the severest type and are easily overlooked. In the two cases following Cesarean section reported by Tarbert, both recovering, one vomited during the operation and the stomach was washed out on the table, the other vomited "large amounts" on the third day and in the case following Cesarean section reported by Barnard which terminated fatally, "the patient never vomited."

Tenderness and rigidity were conspicuously absent throughout the entire illness. The pulse varied between 120 and 150, frequently dropping to the former figure after lavage and then gradually rising again. Both the abdominal distention and the toxemia seemed to be causative factors in increasing the pulse rate.

Laffer says that "unless influenced by an associated infection, the temperature is usually normal, but is often subnormal." Conner and various other authors make practically the same statement and it is undoubtedly true in the great majority of instances. However, in the case under discussion reference to the chart would seem to show that the range of temperature was directly affected by the gastric lavage. There was a decided drop in the temperature and it remained at a lower level with the institution of two-hour lavage. This was succeeded by a rise in temperature when the interval was increased from two to three hours and the temperature again fell and gradually returned to normal when two-hour lavage was persistently employed. Whether the temperature curve which I exhibit was an accidental occurrence or not, I of course am unable to say but I do know that a most striking relationship existed between the general condition of the patient and the amount and character of the fluid found in the stomach at the time of lavage. Repeatedly during the third week of the puerperium the interval between washings was lengthened and was each time followed by an accumulation of fluid and a feeling of indisposition on the part of the patient. In my opinion the fever was undoubtedly due to a toxemia. McWilliams, Herrick, A. E. Halstead, Fairchild and Barnard report cases in which there was a rise in temperature apparently not due to anything but the toxemia of acute gastric dilatation. Fairchild states definitely that the temperature rose and fell before and after lavage but no autopsy was obtained to verify the clinical diagnosis. Halstead's case showed no other lesion at autopsy but acute gastric dilatation. Herrick's case was a cholecystectomy and it is possible that some associated condition was the cause of the rise in temperature as no autopsy was obtained. McWilliam's case recovered. An autopsy was obtained on Barnard's case which died seventy-five hours after operation. The temperature ranged between normal and



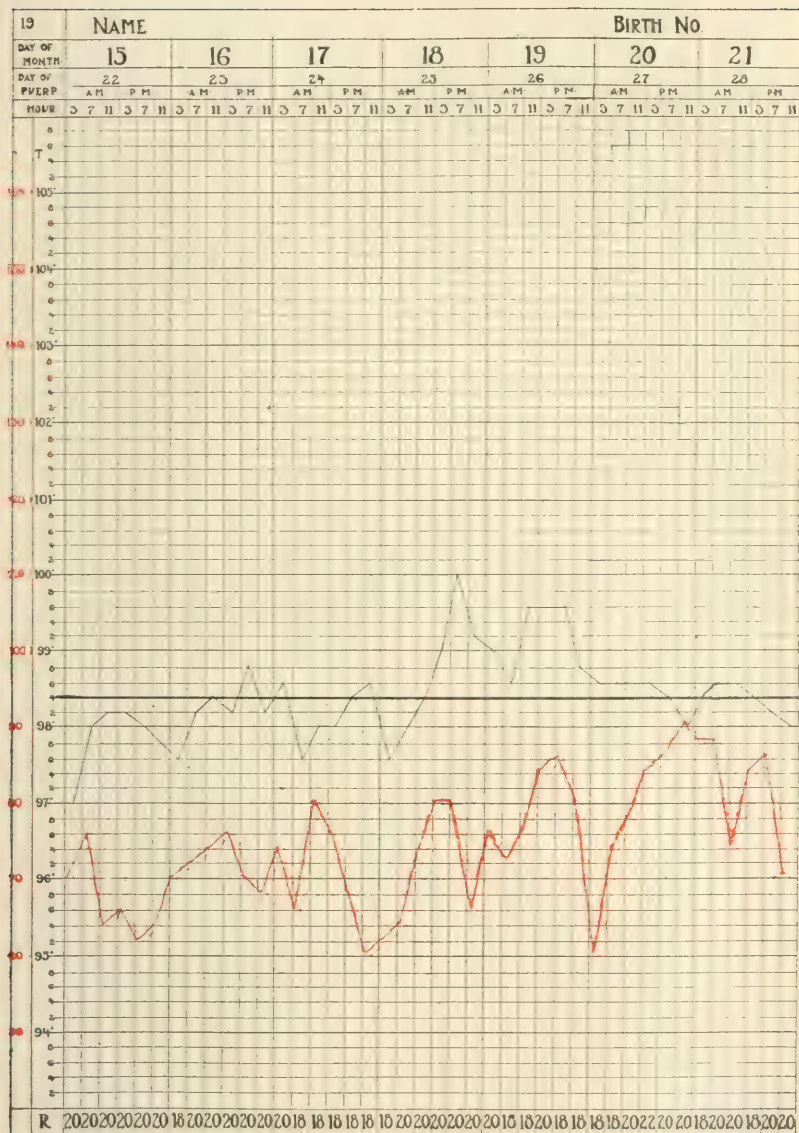


CHART IV.



102.2°F. the pulse between 120 and 164 and the respirations between 22 and 46. Sections from the uterus and cultures from the uterine wound and abdominal cavity taken at the autopsy, "showed no evidences of inflammatory reaction."

Dyspnea was never alarming but well marked during the time when the patient's condition was critical.

The smallest amount of urine in any twenty-four hours (16 ounces), was on the third day. As the patient received fluid by rectum only this cannot be considered a great diminution.

Visible peristalsis and succussion splash were never observed, although carefully looked for.

Hypersecretion was present as was evidenced by the fact that we always obtained from 6 to 8 ounces of dark green, foul-smelling fluid, in spite of the fact that the patient got nothing by mouth. Lengthening the intervals between the washings resulted in greater accumulation. The fluid maintained the same characteristics throughout and undoubtedly resulted from increased gastric and probably duodenal secretion.

Thirst was never extreme.

*Duration of Symptoms.*—The continuation of symptoms was not in the nature of a relapse but the result of persistency of the condition through acute, subacute and chronic stages. Lavage was continued from February 24 till March 29 before it was possible to discontinue it entirely or during a period of thirty-four days. During this time the stomach tube was passed over 200 times. Four or five days or less is the usual duration of lavage when the patient is either dead or well on the way to recovery.

*Diagnosis.*—Peritonitis was excluded as there was no tenderness, rigidity or other evidences of infection except fever, to indicate peritoneal involvement. In addition, when the patient was discharged the uterus was well involuted, freely movable and not adherent, a condition unlikely to follow general peritonitis resulting from Cesarean section. High intestinal obstruction was ruled out by the prolonged illness and the favorable outcome. Obstruction with an onset so violent would have progressed steadily to a fatal termination and a rise in temperature would not have been expected until there was peritonitis. There was never any question as to the possibility of acute pancreatitis, a condition from which it is said to be necessary to differentiate acute dilatation of the stomach.

*Variety.*—Whether this was a case of arteriomesenteric ileus or uncomplicated acute gastric dilatation, it is of course impossible to say. It hardly seems likely that there would be room in the pelvis for the intestines as well as the uterus and descent of the small bowel seems to be the determining factor in occlusion of the duodenojejunal junction.

*Treatment.*—Postural treatment and hypodermic medication appeared useless. The supply of fluid was kept up by rectal and subcutaneous infusion of salt solution. Gastric lavage was the only treatment that caused any amelioration in the symptoms

so far as we were able to judge. If there is one thing to be learned in the treatment of this condition from our case, it is that gastric lavage in acute dilatation of the stomach should be repeated at intervals of not less than two hours. My own feeling is that gastrostomy, with continuous irrigation of the stomach, ought to be the ideal treatment and should be given a trial in cases which do not respond to two-hour lavage.

FORBES AND HALKET STREETS.

DISCUSSION ON THE PAPERS OF DRs. BELL, DAVIS AND  
ZIEGLER.

DR. HERMAN E. HAYD, Buffalo.—I am not going to discuss this subject from the standpoint of Cesarean section, but two of the papers are exceedingly interesting from the point of view of dilatation of the stomach. The experience which Dr. Davis has related is to me very unusual. It seems to me, we cannot put his case into the category of acute gastric dilatation. Unfortunately he did not have the opportunity of making a postmortem examination. I can assume, however, it is possible this woman may have had a dilated stomach previous to her pregnancy, and that this dilatation was in a measure held up and supported by the advancing growing uterus, and just as soon as Dr. Davis emptied the uterus of its contents, together with the profound narcosis to which this woman was subjected, and the large amounts of gas, ether and air which she swallowed, she had simply an acute dilatation of the stomach, as Dr. Davis said, from air dilatation. I cannot imagine any condition of cardiac spasm coming on in a patient who was so deeply narcotized as his patient was, and, therefore, I cannot give any explanation why his house surgeon did not introduce a tube into the woman's stomach, nor can I imagine why a gastroenterostomy would have helped his patient in any way, because I assume she died from ether or chloroform poisoning. This case suggests the importance of advocating the employment of skilled anesthetists in our hospitals. Unfortunately, as surgeons, we are compelled to accept the services of the most untrained and youngest doctors in our hospitals, yet one of the most important duties that the medical man is called upon to perform is the administration of the anesthetic in an operative case. I think we are going to get into trouble before long if we delegate that responsibility to a nurse. I am not familiar with the laws of other states in this respect, but the laws of New York State are such that if we have a death we are responsible, because no one can give an anesthetic in New York State who is not a regular medical graduate. It seems to me, the medico-legal side of this question is likely to come up at any time.

Dr. Ziegler's case was especially interesting and was a classical one of acute dilatation of the stomach. After a man has had a few of these experiences, the practical side of the treatment of these cases presents itself very acutely, so that in any case upon

whom I have operated, if after six hours, vomiting continues following the administration of the anesthetic, and the vomit is of a greenish character, I assume the possibility of an acute gastric dilatation coming on, and I take no chances, but wash out the stomach regularly every four hours. If there are increasing amounts of fluid, as there were in the doctor's case, I would keep up the lavage three or four or six days, if necessary, until all dangerous possibilities have subsided. I am satisfied that with this condition of acute dilatation, the patient being intensely sick, there is an acute toxemia, and the only thing we can do is to get rid of the material that is in the stomach, as quickly as possible, before we allow the pabulum in the stomach to start the fermentative processes. In these cases there is nothing to do except to resort to lavage.

DR. FRANCIS REDER, St. Louis.—The one subject that has interested me in connection with these papers is that of acute gastric dilatation. Dr. Davis laid considerable stress on the anesthetic, saying that in some cases it was unskillfully administered. Where we have persistent vomiting during the administration of an anesthetic, we have every reason to feel anxious about our patient. Such a condition carries with itself a grave danger on account of the depressing effect it has on the system. After the operation when the patient has taken the anesthetic badly, the stomach should invariably be washed out. Patients, in taking an anesthetic frequently swallow a great deal of the agent, in consequence an abnormal secretion may find its way into the stomach, and if the conditions are favorable, may cause an acute toxemia. If we accept the theory of hormones in connection with this functional disturbance, an acute dilatation could be explained on these grounds. I wish to mention the case of a patient, fifteen years of age, who was smoking a strong cigar it was his first smoke. He swallowed considerable of the smoke and became seriously sick. It was an acute toxemia that caused an acute dilatation of the stomach. For four days the condition was serious. The distention was relieved by frequent stomach lavage.

DR. SYLVESTER J. GOODMAN, Columbus.—In reference to the first paper concerning Cesarean section and sterilization of the woman, we must come to a decision of what to do very much as a celebrated painter did, who, when asked how to mix paints, replied "With brains." In this connection I wish to refer to a large series of cases in the practice of my colleague Dr. Baldwin, and a small series of my own.

The first case was one in which the skull of the fetus had been crushed by the attending physician some hours before I saw the woman. Her uterus was full of small fibroids. I advised hysterectomy, but the members of the family refused owing to the fact that the child was dead. This woman has again become pregnant, and I expect to do a second Cesarean section on her next month.



In another case that was referred to me the uterus was likewise found full of fibroids. This woman had been delivered once normally. The child was delivered with some difficulty, but the woman recovered nicely. When I saw her in a later pregnancy she was suffering from a detached placenta. She was delivered at the hospital, and at that time I wanted to do Cesarean section and extirpation of the uterus, but she refused. In her case I should have done a hysterectomy, as in the future she may have a serious time.

In another case, a primipara, twenty-five years of age, with a very large child, the measurements were slightly under normal. This was almost as ideal a case as we could have, although several examinations had been made by a careful physician. I did Cesarean section with the high operation, and she died five days later. On postmortem examination we found no infection of the uterus, but the catgut used had gone all to pieces. It was entirely dissolved, even the knots. After some correspondence with the manufacturer, he told us it was thirty-day catgut. He said that if it went through the peritoneum we could not rely on it. It should have had supporting sutures of silk, and we are doing this at the Grant Hospital in the service of Dr. Baldwin and myself. At our hospital we allow no one to give anesthetics except a trained anesthetist. The laws of Ohio forbid anyone except a registered physician to give anesthetics.

In regard to going through the scar in the second, third, or even fourth Cesarean section, we cut out the scar because it has lost all of its elasticity, and if the woman should have a future pregnancy there is no danger of rupture of the uterus.

DR. WILLIAM H. HUMISTON, Cleveland.—These papers are very interesting, and I feel should be discussed very thoroughly. This Association has no more important function to perform for the rank and file of the profession of the United States than to have more of these obstetric papers published. There is no branch of medicine and surgery in which there is poorer judgment shown than in obstetrics. How many women are there throughout the country who have pelvic measurements made before delivery? We know how important it is that the accoucheur should know the capacity of a woman's pelvis and the size of the fetal head that has to pass through it. When there is a disproportion between the pelvic outlet and the size of the child's head, then it becomes our duty to consider Cesarean section. Cesarean section in an uncontaminated case is so much safer and surer in its results than the high forceps operation, that I believe the time is coming when the high forceps operation will not be resorted to by the general practitioner, but only by the thoroughly trained men in obstetrics. I think it is one of the most formidable operations, as usually performed, that we have, and requires special knowledge, ability and training. Scarcely a week goes by in my service at the hospital (and I have a continuous service of some size) that women are not brought into the

hospital who have lost their child from a high forceps operation. The pelvic floor is torn, and the vagina is torn through to rectum. The cervix is torn to the vaginal junction or through it—a most deplorable condition results. I reported one such case at our last meeting in which a high forceps operation had been done on a dwarf. The child was sacrificed. The patient came under my care for these injuries. She had no control over her urine or feces, and had infection. Later I operated and she made a good recovery, and within six months was again pregnant. I delivered her at the beginning of labor of a healthy child by the high Cesarean operation and her convalescence was rapid; she was out of the hospital on the tenth day.

I wish this Association might have a larger proportion of papers upon obstetric subjects for our future meetings.

The indications for Cesarean section, as I view them, have been greatly widened, and I wish to go upon record as stating that there will be more Cesarean sections performed in the next few years than there have been in the past.

DR. WILLIAM SEAMAN BAINBRIDGE, of New York City, recalled two cases in his own experience that illustrate certain points that may be further emphasized. The first has reference to the question of sterilization; the second concerns acute dilatation of the stomach.

The first case was that of a woman, referred to him about four years ago. There was a history of six pregnancies, with attempts at delivery in each, most of them instrumental, but premature, and with death of the child in each case. The patient had a just minor pelvis, the entire floor of which was torn away. The bladder was opened, and there was a vesicovaginal fistula, as well as a rectovaginal fistula. The necessary repairing was done, and the patient was told that she must not become pregnant again. Despite this advice, she returned a year and some months later pregnant. She was told that it would be necessary to do a Cesarean section, the operation being explained to her. The operation was successfully performed. The husband and the patient, as well as the physician who had referred the case, wanted to have the tubes tied in order to prevent further pregnancies. This was acceded to, the tubes being tied with silk in two places. Unfortunately some time afterward she lost her child from pneumonia, and now is anxious to have the tubes untied. Dr. Bainbridge considered that one assumes a very great and serious responsibility, even in the exercise of one's best judgment, in taking away from a woman the right to have a living child.

The second case cited had a bearing on the question of acute dilatation of the stomach. According to Dr. Hayd, the only thing that can be done in such cases is to resort to gastric lavage. The speaker thought perhaps something more could be done than ordinary *gastric* lavage. He recalled the case of a woman with extensive carcinoma of the breast, who had consulted him about

five years ago. At that time she had bronchitis and was in no condition then for operation. She was sent to the country for a short time. The cancer grew more rapidly, but the bronchitis disappeared, and the patient returned for operation. An expert anesthetist gave the anesthetic. The patient developed an acute postanesthetic pneumonia and dilatation of the stomach. Lavage was employed. After washing out the stomach a great deal of distention below was found. The patient was placed in the extreme Fowler position and away over to the right side; then, after thorough lavage, the contents of the overdistended stomach siphoned out. It was possible thus to diminish the swelling or distention below the stomach. In other words, he was able to siphon out a great deal of the fecal and semifecal material beyond the pylorus. This relieved the patient markedly and, repeated several times, caused the disappearance of the severe symptoms. It was just as important, in the speaker's judgment, to siphon out the material in the intestine as it was to get rid of the material in the stomach itself.

Dr. Bainbridge added a word with reference to the use of glucose, as he had seen it employed by several men in London. It was introduced by rectum or in the saline under the breast, in order to prevent acute dilatation of the stomach and to lessen postoperative shock and postanesthetic vomiting. They added from half an ounce to an ounce of glucose or dextrose to the fluid given by the rectum every three or four hours. The same amount sterilized, was added to the fluid used in hypodermoclysis. Those who employ it believe it reestablishes the glyco-genic balance of the liver, which is a factor in the diminished vitality of the muscle wall of the gastric organ, and in the production of shock. Whether this is the explanation or not, they believe the patient gets less postoperative vomiting and dilatation of the stomach when glucose or dextrose is introduced to take the place of that which the liver fails to give to the general system immediately following or a few hours after the operation.

DR. A. S. HOTALING, Syracuse.—I wish to speak briefly of a complication I met with following Cesarean section, that is, rupture through the scar, and I would like to ask Dr. Davis if he has met with a similar case. The text-books all speak of such a complication, but the cases reported in the literature are very few.

Two years ago, I did a Cesarean section on a girl, seventeen years of age, for eclampsia. She was seven and one-half months pregnant. She had an undilated, unobliterated cervix. At that time she was in the hospital as a ward patient. About a month ago she came into the hospital as a private patient, having been brought in by her physician who thought she was in labor. This was about 9 P. M.; she died shortly after 1 A. M. from hemorrhage. Autopsy the next morning showed rupture of the uterus. The organs were all transposed. The liver was on the left side, the heart on the right, and so on. I might say in this case the uterus



was closed with a double row of catgut sutures, and in addition to that there were three supporting silk sutures. The rupture was directly through the old scar.

DR. HUGO O. PANTZER, Indianapolis.—Bearing on the multiple etiology of gastric dilatation, I wish to report a case that recently came under my observation in support of the position taken by Dr. Davis. In his case the pressure applied to the stomach may have been a factor in producing gastric dilatation. My patient had on a very snugly fitting corset while attending one of our automobile races. She was brought away from there in convulsions. Nothing more nor less was found at fault than an acute dilatation of the stomach brought on by the tight constriction of the abdomen through the corset.

With regard to the mooted advisability of sterilizing a woman, I think it well to hold to the rule of principle. Actions by principle will always in the end tally better than actions governed by opportunistic policy. The man who pursues an opportunistic policy, will come to disaster sooner or later. This is very clearly shown in other fields, notably at this time in politics. Where there is no immediate pressing indication to sterilize, this should not be done.

DR. BELL (closing).—I have nothing further to say except to thank those gentlemen who have discussed my paper.

DR. DAVIS (closing the discussion on his part).—In the matter of delivering the uterus at the time of Cesarean section, we, in the Lying-in Hospital practised that method for a considerable time. It was the best that we could do following the teaching of that time, but we found in observing these cases, that they were in good condition during the early part of the operation, but as soon as we began to deliver the unemptied uterus from the abdomen there was at once evidence of a considerable amount of shock, due to the forcible manipulation and evisceration. It was unnecessary interference. It is unnecessary to remove the uterus from the abdomen. It is a somewhat easier operation to deliver the uterus and empty and suture it outside of the abdomen but in performing Cesarean section we do as little as we are obliged to. We deliver the child, close the wounds and conduct the mother into the condition of a normal puerperium with as little interference and as soon as possible. We are able to do this with a small incision with little handling of the uterus. Many times we do not see the intestines or tubes, but only the fundus and anterior surface of the uterus come into view. In cases of fibroid tumors and other complications which are not urgent, we do not believe in interfering with them at the time Cesarean section is performed. If there is to be a hysterectomy or myomectomy, or anything of the kind, let it be done later, because after three to six weeks, it can be done much more readily, after involution of the uterus and neighboring structures had taken place and the vascularity is much diminished. It is an altogether safer and more satisfactory time in which to operate.

In regard to measurements of the pelvis and the child, we should by all means measure the pelvis and, in so far as possible, measure the child, but we would be led astray many times if we depended upon these measurements too implicitly. They should be used as an aid to our judgment in determining what is best to do in each case. There are many cases in which the measurements of the pelvis are ample and the child does not appear unduly large, and yet, when the woman is in labor, the fetal head does not engage and labor does not progress. It is better, I believe, where there is evident disproportion between the size of the child and the capacity of the pelvis, regardless of pelvis measurements, to do a Cesarean operation. We may have a case in which the internal diagonal conjugate is 14 centimeters, yet the rest of the pelvis is contracted and the head does not come down, or the head is abnormal and does not mold and yield to pressure. On the other hand, we meet cases in which the external conjugate is only 17 centimeters. A justminor pelvis in a small thin justminor woman with small bones, the child is also small with bones of the fetal head capable of being readily molded. Many of this type of case go on in labor and either deliver themselves without assistance or they are able to force the fetal head down to the pelvic floor from whence it can be readily delivered with the aid of low forceps. But to depend entirely upon the measurements of either mother or child is not in accordance with our best knowledge of this subject.

I would like to emphasize the importance of determining early whether Cesarean section is to be done. I believe there is a great deal of morbidity which can be avoided, and some mortality, if we operate early before the patient's resistance has been lowered by exhaustion and fatigue intoxication and before the membranes have long been ruptured and many vaginal examinations have been made or attempts at vaginal delivery have been tried. We occasionally see cases of primiparæ continuing long in labor; according to the measurements, labor should not be difficult, and we do not watch them closely enough, and after a number of hours, we wake up to the fact that labor is not progressing. I recall a case in which no examinations were made except with sterile gloves in the hospital.

The membranes had been ruptured for many hours, the cervix was fully dilated, there was a considerable caput and a portion of the head engaged but there was no further descent. Cesarean section was performed and the patient had a long drawn out recovery. Had this patient been operated upon earlier she would have been one of the ten to fifteen day cases to leave the hospital.

DR. DARNALL.—I would like to ask Dr. Davis whether he had any difficulty or trouble from meconium and amniotic fluid flowing into the abdominal cavity in doing the operation inside the abdomen rather than delivering the uterus.

DR. DAVIS.—We pay very little attention to that. It does

flow into the abdominal cavity more or less, but we have had very little trouble from that source.

DR. HALL.—Do you try to mop it out?

DR. DAVIS.—Not much. We believe in doing as little injury by sponging or manipulation as possible.

DR. HAYD.—You want us to understand that if the case has not been tampered with mechanically that the amniotic fluid is sterile?

DR. DAVIS.—It is sterile, and we pay very little attention to it. We depend very largely upon the uterus being held up against the abdominal opening by the hands of the assistant externally.

DR. WERDER.—In septic cases you do?

DR. DAVIS.—In septic cases we try to avoid it as much as possible by gauze pads, etc. A very small quantity of septic liquor amnii is sufficient to inoculate the whole peritoneal cavity and in these cases, we cannot by any means now known to us wholly avoid such inoculation. Such cases are not favorable subjects and we now are less often led to perform this operation upon them. In these septic cases we have a rapid pulse at once after the operation, out of proportion to the temperature and the general appearance of the patient. We have moderate fever which becomes very high before death. Upon opening the abdomen of several of these patients after death, we have not found general peritonitis. The peritoneum is glistening in appearance except in the lower part of the abdomen there were rather sharply defined localized areas which appeared as though some corrosive fluid had been spilled over them. The wounds are covered with a grumous material full of bacteria and there is no attempt at union. We believe that such patients die from an intense systemic intoxication.

DR. HUMISTON.—Do you pack off the abdominal cavity around the uterus before you open it?

DR. DAVIS.—Formerly I used to place pads all about the uterus, in some cases I have used no pads at all. I now use two or three pads placed above the fundus with the idea of holding the intestines and omentum back in the abdomen, and then depend upon the pressure which the assistant is able to make to hold the uterus against the abdominal opening. The pressure can be kept up continually until the sutures are in place. I believe that the abrasions of the uterine and parietal peritoneum made by forcing pads in where the abdominal wall fits closely over the distended uterus do more harm than any good that comes from their use.

DR. HUGGINS.—Do you remove the uterus?

DR. DAVIS.—I never remove the uterus, but in septic cases where we feel that we are in danger of losing the woman from sepsis, I believe that a free wide open incision below the umbilicus and packing well around the uterus and doing a supravaginal hysterectomy, removing the child quickly from the uterus after it has been amputated and delivered from abdomen and



closing over the stump with peritoneum is an ideal way of operating. I have had no experience with this procedure, but I think it is the thing to do, providing that we perform Cesarean section at all upon evidently septic cases. Dr. Bainbridge has called attention to a point which I did not touch upon in my paper.

That is, a large number of difficult and complicated obstetrical patients eventually gravitate to the Lying-in services in hospitals, so that the percentage of such cases in hospital practice is relatively higher than it is in the community at large. Patients come to us with the histories of two, three, four or more pregnancies with operative vaginal deliveries and either stillbirth or children who live but a few hours because of the injuries they have been subjected to in every case. Let us stop for a moment and think what these women have endured. They have spent eighteen to thirty-six or more months in the discomfort and dangers and hopes and fears of pregnancy, to repeated operative deliveries, to dangers and permanent injuries, many of us here can appreciate how great, and with all this, to the repeated disappointment of not having a living child. We can offer such women something better to-day. We can deliver them with very little danger by abdominal Cesarean section, they have not been subjected to long labor and contaminating vaginal interference and we can almost without exception give them a living child if the child is well developed and healthy at the time of operation.

The question as to rupture of the uterus in labors subsequent to one or more Cesarean deliveries has been raised. In this series of 147 Cesarean deliveries, twenty-six patients were thus delivered more than once and in this latter number rupture of the uterus occurred twice, but in cases who had not taken the precautions for even an ordinary delivery. In only one case had the uterine scar given way and that for only about 3 centimeters of its length, so that, while the danger is one which we must recognize, it is not very great. I have used chromic catgut in the uterine wound for nearly all of my cases and never have seen it give way. In the matter of repeated Cesarean sections, in the early spring of this year, Dr. Harrar, of the Attending Staff, made a rather exhaustive study of this subject and presented his results in a paper before the New York Academy of Medicine (AMER. JOUR. OBST., May, 1912). In it he brought out a point which had not occurred to me: that, if there are two or more lines of scar tissue side by side in the uterus, the short muscle fibers between them are weak and more liable to give way under the strain of labor. In our cases it had not been the practice to dissect the cicatrix out either in the abdomen or the uterus. We have cut directly through it each time. Sometimes we are not able to find any uterine scar.

DR. ZINKE.—I would like to ask a question. When you operate on a case in which you use silk sutures, in performing Cesarean section, no matter whether it be the second, third, fourth or fifth time, do you find any evidence of the silk sutures?

DR. DAVIS.—In our early experience we were all using silk sutures, and, so far as I am aware none of these cases have come to us for subsequent Cesarean section; I never have found evidence of silk sutures in the uterine wound in any case, but in the case which I have described the patient did not come under my care for the second Cesarean section. Following her operation she did not menstruate for a year and a half and she grew very stout. About a year after her delivery she developed an inflamed area in the abdominal scar which later broke down as a sinus. Soon after this she entered a hospital, the sinus was opened and a silk suture was removed, and the sinus closed. Later she became pregnant and, I understand, placed herself in the care of an obstetrician who promised her that it was not necessary for her to be delivered by Cesarean section, that by inducing premature labor she would be given a living child without the dangers of Cesarean section. Induction of labor was attempted and after a good deal of vaginal manipulation had been indulged in, she was delivered by a second Cesarean section, followed a few days later by hysterectomy and death from sepsis. Pelvic measurements do not always bring out the capacity of the pelvis. We may have a very high promontory and in some cases a jutting forward of the lumbar vertebræ in such a way that the head will not enter the pelvic brim, although it should do this according to the measurements.

We tried the effect of change in posture upon lavage but were unable to get better results than with the patient in the dorsal position.

As to the value of pelvic mensuration, to which reference has been made, I wish to say that it is of relative value only. There are many factors to be considered. Of course, no one ever attempts to say definitely that a baby will or will not pass through the pelvis in certain border-line cases. But it is precisely in this class of cases that pelvic measurements may be of distinct value if we depend, not upon the external measurements alone which are usually of little value, but upon the internal measurements. I have seen numbers of cases where spontaneous labor took place through pelves of the size and type I have described. As there was in my case, no moulding or caput formation, nothing to indicate injury to either the fetal or maternal tissues and no chance of infection, we have had no reason to regret giving the patient the test of labor before interfering. In my opinion, Cesarean section is done many times unnecessarily. A maternal mortality of 11 per cent. is not low for the operation. The test of labor judiciously applied and the premature induction of labor in selected cases, will make Cesarean section unnecessary in the vast majority of cases. Craniotomy in infected cases, in which the child is dead or dying or its condition doubtful, is the operation of choice. In a pelvis not absolutely contracted, Cesarean section when the baby is dead, is never justifiable and is always followed by a high mortality. Craniotomy in such

cases has a very low maternal mortality. I have never lost a case.

As to the incision of the uterus before delivering it, there can be no comparison with incision after delivery. Hirst of Philadelphia, who has had a very extensive experience with Cesarean section, always delivers the uterus before incising it. He has had 127 consecutive sections, with six maternal deaths only, a mortality of about  $4\frac{3}{4}$  per cent. There can be no question but that the peritoneal cavity can be better protected against infection by the uterine contents, if the uterus is delivered before incising it. In all cases which have been examined a number of times and especially when attempts at delivery have been made, there is always present the great probability of infection of the uterine cavity. It is a physical impossibility, in such cases, to prevent contamination of the peritoneal cavity, if the uterus is incised *in situ*.

The procedure which I have employed in a limited number of cases, is carried out as follows: An incision large enough to permit delivery of the uterus, is made through the right rectus muscle, with its mid-point on a level with the umbilicus. Before delivering the uterus, four temporary sutures, of heavy silk, are passed through the abdominal walls on either side, from within out, at regular intervals. The lower suture is so placed that, when tied, it will bring the edges of the abdominal wound together close against the posterior surface of the delivered uterus. The sutures are long enough to permit their being slipped up over the fundus while the uterus is being delivered. As soon as the uterus is delivered, the silk sutures are tied from above down, bringing the edges of the abdominal wound together, thus avoiding the necessity of placing pads within the peritoneal cavity or of handling the intestines. The abdominal walls are covered with hot towels, and a large piece of heavy rubber sheeting, with a slit in its center, is next slipped over the uterus which it hugs closely about its lower segment, and is spread out over the abdominal walls. In this way all possibility of fluid entering the abdominal cavity is effectively avoided. The uterus is next incised, the baby and fetal appendages delivered and the uterine wound closed. The lower silk suture is next removed, the uterus returned to the abdomen and the peritoneum closed from below upward, the silk sutures being removed in order as we go along. Our results have been most gratifying. We have entirely eliminated distention of the bowel which so frequently follows the use of packing and the handling of the bowel. I do not believe that delivery of the uterus before incising it had anything to do with the acute dilatation as has been intimated, since not a case occurred in Hirst's long series.



MECHANISM AND TREATMENT OF PLACENTA PREVIA.<sup>1</sup>

BY

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At the last meeting of the American Medical Association there were read in the Section on Obstetrics and Gynecology several papers which touched more or less on Cesarean section as a justifiable means in the treatment of certain cases of placenta previa, and it appeared from the discussion that many of the members of the Section were of the opinion that placenta previa ought to form an even more frequent indication for Cesarean section than was claimed by the essayists. It was claimed by some that in placenta previa treated by other methods the maternal mortality amounted to from 20 to 30 per cent., and the fetal mortality is several times as great, whereas, if these cases were treated by Cesarean section, the maternal mortality could be reduced to 5 per cent., and the fetal mortality would likewise become much smaller.

The time for discussion was too limited to argue so important a question, and I therefore announced the following contentions:

No form of placenta previa, as such, ever offers a justifiable indication for Cesarean section.

Version after Braxton-Hicks in the presence of a viable child deliberately sacrifices the life of that child and has no place in modern obstetrics.

The cervical and vaginal tampon and the intrauterine use of rubber bags are safe and efficient means for controlling hemorrhage and for securing sufficient dilatation for delivery through the natural passages.

I further announced that I would defend these contentions at this present meeting of the American Association of Obstetricians and Gynecologists at Toledo.

To make things quite plain, let us consider placenta previa from the clinical standpoint only; let us see in what way the mechanism of labor is affected when the placenta is found in

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

the lower pole of the ovum instead of the upper one; let us see what clinical symptoms such disturbed mechanism produces and what the effects of these disturbances are on mother and child. Next let us consider under what conditions we have met these cases in the past; how we have arrived at a diagnosis, and how much or how little need there has been for prompt action; let us see whether placenta previa is a condition in which an early diagnosis will enable the practitioner to have the case transported to a hospital and placed in the hand of a specialist, or whether it is a condition that requires immediate action whenever it manifests itself, so that the majority of cases must be handled by the practitioner away from medical centers.

By the mechanism of the first stage of labor that portion of the parturient canal which is composed of the lower segment of the uterus and of the cervix, is dilated and stretched until it forms a cylindrical passageway of about 12 centimeters in diameter, and of about three times its original length. The upper boundary of this passageway is formed by the contraction ring, the lower boundary is formed by the margin of the external os. This dilatation and stretching is accomplished by the contractions of the muscular fibers of the uterine body above the lower segment. When these fibers contract the space which they enclose must become smaller and the contents of the uterine cavity must either be compressed or they must move in part out of the contracting area. For practical purposes the ovum is not a compressible body; therefore, when the uterine cavity above the lower margin of the contracting zone becomes smaller, the space lost must be made up below that zone in the lower segment of the uterus, and this is what happens: The lower segment is stretched until the space it encloses is much increased; this stretching causes a detachment of the lower pole of the ovum from the uterine wall, beginning at the internal os and extending upward in all directions for a distance of several centimeters. The stretching of the lower segment in turn pulls on the margins of the internal mouth of the womb, and causes it to open up. Finally, a diverticle of the membranes descends below the level of the inner os, forming a fluid wedge, which, as it increases in size, gradually stretches the walls of the cervix and dilates the cervical canal until it is large enough for the passage of the child.

Under normal conditions the first stage of labor is completed while the ovum remains in its entirety; the amniotic fluid equalizes the pressure on the fetus and prevents the uterine

walls from contracting to a degree which would seriously interfere with the placental circulation.

When the membranes have ruptured prematurely, dilatation is effected in the same way, but less gently, and with considerable danger to the placental circulation. The downward pressure is no longer exerted on the entire ovum, but on the fetus alone, which now is forced downward while the lower segment and the cervical canal are being stretched over the presenting part.

Uterine contractions take place throughout pregnancy, but usually they are not strong enough to effect any degree of dilatation until pregnancy has advanced to within six or eight weeks from term, when the effect of these contractions is quite evident. During the first half of pregnancy the inner os is always closed, but toward the end of the second half the inner os is found open in the majority of multiparous women, so that many weeks before term the examining finger can be inserted through the internal mouth of the womb, through which the presenting part may be felt covered with the fetal membranes.

In primiparous women I have often found the same condition and in all of them the stretching of the lower segment is considerably advanced long before labor sets in, so that, as a rule, the head is found low in the pelvis and can be plainly palpated. When the placenta is found at the lower pole of the ovum, as it is in the various forms of placenta previa, the same mechanism is set in motion when pregnancy has sufficiently advanced, but as soon as a separation of this lower pole of the ovum from the uterine wall takes place, there is unavoidable hemorrhage; the separation takes place in the decidua serotina, which means that uteroplacental vessels are torn in the detached area and pour out maternal blood.

This hemorrhage occurs in all cases of placenta previa; in some before the fetus is viable, in others after viability has been reached, but while the fetus is still more or less immature and a few cases go to full term before there is any bleeding.

When labor sets in, dilatation of the parturient canal proceeds in the usual way. The bag of waters is formed, but its walls are composed entirely or in part of placental tissue. During each labor pain the ovum is pushed down in its entirety against the lower uterine segment—the force is usually sufficient to compress the torn uterine vessels and to stop the bleeding, but as soon as there is a relaxation of the uterine wall the pressure is removed and there is renewed outpour of blood.



The detachment of the central portion of the placenta in an area of 10 or 12 centimeters diameter does not, as a rule, endanger the life of the fetus in cases of placenta previa, for in these cases the placenta is much thinner than usual and covers greater space, so that when the external os is fully dilated there remains attached to the uterine wall an outer ring of placenta from 8 to 10 centimeters in width which suffices to carry on the placental respiration until delivery is completed.

Almost without exception every case of placenta previa which I have attended announced itself by a sudden hemorrhage, on account of which I or a fellow practitioner was hurried to the patient. At times the patient had been asleep and in the middle of the night she was found in a pool of blood; at other times she had been attending to household duties or she was away from home when the hemorrhage started.

With few exceptions this hemorrhage was such a severe one as to require immediate attention. This always consisted in removing the clots of blood from the vagina; in making an examination, and in checking the hemorrhage by a tight cervical and vaginal pack, or, if there was sufficient dilatation, in delivering the patient. In some cases there was sufficient dilatation to enable me to introduce a hand, detach the placenta on one side, go up to the feet, turn the child and deliver the woman at once; at other times there was a good bag of waters which consisted in part of placenta and in part of fetal membranes; in some of these cases it sufficed to rupture the membranes, when the head would come down and press the detached portion of the placenta so tightly against the bleeding uterine wall as to stop the hemorrhage; such cases would deliver themselves or were terminated by forceps. At other times the fetus presented crosswise or feet first, which made delivery an easy matter. There remained, however, many cases in which the inner os was only slightly dilated and in a few instances there was no dilatation at all. In these cases with insufficient dilatation cervix and vagina were packed with absorbent cotton squeezed out in some antiseptic solution, or with strips of sterile gauze. After the patient was thus safe for the time being, she was transferred to a hospital or preparations were made to deliver her at home.

It is possible by proper packing to control the hemorrhage absolutely, but the pack has to be so tight that it usually produces labor pains, which in most cases is an advantage. The pack may remain undisturbed for from eight to twelve hours;

formerly I renewed the pack several times, but of late years I prefer to introduce a medium-sized Champetier de Ribes bag into the uterus if on removal of the first pack there is not sufficient dilatation. The bag is introduced into the uterus below the placenta so as to leave the ovum in its entirety. By so doing dilatation is accomplished more gently and quickly, and after delivery of the child the placenta comes away with greater ease and completeness. In most cases a dilatation of from 9 to 10 centimeters is sufficient because so many of the babies are premature or undersized.

In February, 1909, I reported the results of this method of treatment of placenta previa.<sup>(1)</sup> Of fifty mothers, one had died, a maternal mortality of 2 per cent. In May of the same year I reported two more cases of central placenta previa which had reached Washington University Hospital at a time when the cervix barely admitted the finger. Both cases were successfully handled by the vaginal pack and the intrauterine balloon, and were terminated by podalic version.<sup>(2)</sup>

Since these reports the results of treating placenta previa by this method have remained uniformly good in my hands, and what is still more gratifying is the fact that the same method is successfully employed by general practitioners who have been instructed by me, as is illustrated by the following reports:

CASE I. *Central Placenta Previa*.—Dr. Carl Zimmermann, East St. Louis, Illinois.

Mrs. R., thirty-five years old, expected her first baby August 17, 1910 (last menstruation November 10, 1909). At midnight, July 17, 1910, she is seized with a severe hemorrhage; the os uteri barely admits the finger; it is filled out entirely by placental tissue; the hemorrhage is stopped by a tight cervical and vaginal pack; the packing is removed several times until July 20, when there is 3 centimeters dilatation. Nothing but placental tissue can be felt. The placenta is found detached for some distance from the margin of the inner os. Into the space thus formed a colpeurynter is introduced and inflated with 500 c.c. of sterile water. Immediately strong pains set in and in fifteen minutes the bag is born, followed by a gush of blood. The os shows almost complete dilatation and is still filled out entirely by placental tissue. The left hand is introduced on the right side between placenta and the uterine wall; the placenta is peeled off; the membranes are ruptured; the right foot is seized and a living male child is delivered by podalic version. The placenta comes away easily on pressure from above. The mother made an uneventful recovery and nursed the baby.

CASE II. *Central Placenta Previa*.—Dr. B. H. Portuondo, Belleville, Illinois.

Mrs. M., aged thirty-six years, mother of five children; last menstruation December 20, 1910. June 20, 1911, slight bleeding. August 10, 1911, severe hemorrhage; os admits two fingers and is filled out with placental tissue. Cervical and vaginal pack. After four hours, complete dilatation. A living boy is rapidly delivered by podalic version. The mother made an uneventful recovery. The baby was five weeks premature, according to the menstrual history, but looked much younger. It died on the seventh day.

CASE III. *Central Placenta Previa*.—Dr. A. Newell, St. Louis.

Mrs. R., twenty-five years old, is in her third pregnancy. Last menstruation November 10, 1911; time of expected delivery, August 17, 1912. Slight bleeding in June. On July 5, severe hemorrhage. The internal os barely admits finger and is filled out by placental tissue. Vaginal and cervical pack. July 8, 10 A. M., inner os dilated to a diameter of 3 centimeters. Nothing but placental tissue can be felt. A medium-sized Champetier de Ribes bag is introduced, which detached the placenta to some extent; the bag is placed below the placenta. At 5 P. M. pains are very severe; the bag is removed. There is about 9 centimeters dilatation; placental tissue fills the os completely. The right hand is introduced into the vagina; the placenta is detached from the left uterine wall; the membranes are ruptured; the left foot is seized and the child is delivered by podalic version. It is a girl, weighing 6 pounds. It is slightly asphyxiated, but is easily brought to. The mother made an uneventful recovery.

Statistics on maternal and fetal mortality serve no purpose unless they are correctly interpreted. When all cases of placenta previa which have occurred during a calendar year in any certain district—let us say, in the State of Ohio—are conscientiously reported, it will be found that the maternal mortality is very high, perhaps 20 per cent. or more, and that the fetal mortality is still more frightful, but such statistics would include all the cases which have been sacrificed because their obstetrical attendants, both males and females, lacked the special training to deal with this emergency, and which I claim ought to be furnished by the medical schools.

The legitimate maternal mortality in placenta previa does not exceed 4 per cent. (it was 3.69 per cent. in the Dublin Lying-In Hospital, and 3.8 per cent. in the maternities of Berlin).

The fetal mortality must always remain high, because delivery often takes place when the fetus is more or less premature. Version after Braxton-Hicks in the presence of a viable fetus has in the past likewise added to the fetal mortality.

The principal dangers connected with placenta previa are hemorrhage and infection.



The cervical and vaginal pack and the intrauterine balloon treatment, each by itself or in combination, are fully able to control the hemorrhage until there is enough dilatation to deliver by podalic version, forceps, or other means. It is possible to avoid infection by observing the rules of asepsis and antisepsis, and it is possible to teach the general practitioner the use of these obstetrical means and the observance of these rules, and thus to enable him to meet the emergencies arising from placenta previa at times and in places in which nothing but prompt and well-directed action on part of the attending physician can save the life of the patient.

In conclusion, I repeat my contentions:

1. No form of placenta previa, as such, ever offers a justifiable indication for Cesarean section.
2. Version after Braxton-Hicks in the presence of a viable child deliberately sacrifices the life of that child and has no place in modern obstetrics.
3. The cervical and vaginal tampon and the intrauterine use of rubber bags are safe and efficient means for controlling hemorrhage and for securing sufficient dilatation for delivery through the natural passages.

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#### DISCUSSION.

DR. E. GUSTAV ZINKE, Cincinnati.—My friend Dr. Schwarz cannot quarrel with me nor can he make me recede from the ground that I occupy. It is just as wrong to say that Cesarean section is never indicated in placenta previa as it is to say that the only operation for placenta previa is Cesarean section. Dr. Schwarz has made a very broad statement. We cannot doubt his position, and he shall have no doubt about mine. When I read my paper on placenta previa advocating Cesarean section eleven years ago in Cleveland, Ohio, I did not meet with a single supporter. I was not the first to recommend Cesarean section for placenta previa. The credit belongs to Lawson Tait. I performed my first Cesarean section for placenta previa about two months ago. My position has been misunderstood. I have been misquoted; sometimes unintentionally, sometimes intentionally. When you have a case of placenta previa centralis in

a normal uterus, when the placenta has been formed normally, when the placental tissues do not penetrate the uterine musculature, when the thickness of the uterine wall is uniform throughout, even at the placental site, that case, in the hands of a skillful obstetrician, such as my friend Dr. Schwarz is, will admit of dilatation to its full extent, in many instances, without serious hemorrhages. But the situation is an entirely different one when you have a diseased musculature and an abnormal implantation of the placenta into the structure of the muscularis of the uterus. Then you do not get the separation observed under normal conditions, and the hemorrhage is uncontrollable in spite of the best of management. Again we come in contact with cases where we have a rigid os because of hyperplasia, possibly incipient malignancy, which may or may not be recognized at the time. Hemorrhage does not take place until dilatation begins, and if the obstetrician introduces his hand for the purpose of dilatation, whether he uses the method of Harris or of Edgar, that patient will be brought to the verge of death before the child is delivered. These are the cases for which I have recommended Cesarean section.

It was remarked a moment ago that Cesarean section is not performed often enough, and another speaker stated that it is performed too often. That criticism pertains to every operation. We must depend upon the honesty and acuity of judgment of the practitioner in charge of the case. The personal equation comes in here. There are cases which can only be saved by Cesarean section, all the arguments to the contrary notwithstanding.

DR. MILES F. PORTER, Ft. Wayne.—I would like to ask Dr. Schwartz what his mortality was.

DR. SCHWARZ.—Almost every child is born in the condition in which it was when the case reached me. The mortality probably amounted to 40 per cent.

DR. PORTER.—Speaking of the subject of Cesarean section as a means of controlling hemorrhage and saving the woman and child as compared with the packing method, it would be well perhaps for us to go back to some of the things we learned in our school days. If hemorrhage occurs as a result of the separation that takes place from cervical dilatation, you can control it by packing. The control of the hemorrhage is largely dependent upon the pressure that comes from above the bag of waters, and can any man introduce packing there that will overcome a pressure of 110 millimeters? It cannot be done. It will control it sometimes, but there are cases in which it will not, and that is a physical problem we have to contend with in a good many cases. It seems to me, the point is, how many children did he save by the packing, and how many children might have been saved by Cesarean section. I undertake to say, that a woman in good health, known to be the possessor of a viable child at term, with a placenta previa centralis, can be given a better chance for her own life, and she can have her child given a

better chance to live by Cesarean section at the hands of a good man than she can by any skilled obstetric procedure at the hands of the best obstetrician ever yet created. It does not mean that Cesarean section is to be always used, nor on the other hand, does it mean that it is always to be proscribed, but if you have a viable child, with the mother in good condition, the delivery of that child by Cesarean section will give it the best chance to live without added risk to the mother. We were all babies once, and if we do not take care of the babies, we will never have any more mothers.

DR. JOHN NORVAL BELL, Detroit.—Dr. Schwarz shook hands with me a short time ago, and said we may not be such good friends after we get through with this discussion. I take exception to one remark made by him, and that is that *no* form of placenta previa is an indication for Cesarean section. My remarks were directed entirely to cases of placenta previa centralis.

I would like to ask Dr. Schwarz in closing the discussion how he would handle a case of placenta previa centralis and expect to get the baby alive.

DR. MAGNUS A. TATE, Cincinnati.—I know of no subject that elicits more discussion than the one we have before us today. We have had this subject up in Cincinnati a good many times, and most of us I think take a ground that is opposite from that of my distinguished friend. The last time the subject was up for discussion, I reported three cases of placenta previa centralis which I treated obstetrically and saved all the mothers and two children. I do not believe that any of the advocates of Cesarean operation mean that they would make it when the placenta is situated laterally. Their contention is that it be situated centrally.

My distinguished friend mentions some of the indications whereby he would perform this operation, and among them malignancy, etc. If you have a case of malignancy or fibroid tumor, or anything else of that kind complicating the case, you make the Cesarean section for the malignancy and for fibroid, and not for a case of placenta previa centralis.

DR. ZINKE.—I meant cases of incipient malignancy, the diagnosis of which cannot be made at the time.

DR. TATE (resuming).—Whenever such a subject is brought up before a body of surgeons, you will find that nine out of ten of them will advocate the performance of this operation, whereas if brought up before a society of skilled and trained obstetricians, they, as a rule will rely upon the treatment as laid down by Dr. Schwarz, and it seems to me one of the crying needs of this country at the present time is more trained obstetricians and fewer skilled surgeons.

DR. CHANNING W. BARRETT, Chicago.—In relation to the subject of Cesarean section for placenta previa, it might be well to take into consideration some points in the histology and path-



ology of the implantation. There was a time perhaps in the embryology or in the history of the Mullerian tract when it was largely the egg-bearing portion by the differentiation of work. By specialization the uterus has become the egg-bearing portion and the tube and cervix, the egg-carrying portion. When pregnancy takes place in a tube, the impregnated ovum is held and becomes implanted, it finds poorly constructed tissue to resist the inroads of the ovum. The trophoblast eats into the structure. When the implantation takes place in the cervix, it also finds the cervix poorly constructed to resist the implantation and the trophoblast eats into the cervix, so that we are dealing with a condition not only of separation but of implanted membranes, and when dilatation takes place, the tissues easily tear. The tissues bleed easily, and so when we are going to deliver a patient the element of hemorrhage is considerable, as we have heard, but the element of time is also important.

Dr. Schwarz takes the ground that no case of placenta previa *per se* should receive Cesarean section, but we get cases in which the element of time is an important factor. We may be able to deliver a case of placenta previa if everything went on easily, if the cervix was going to dilate easily, if there is no resistance, but if we find a cervix that barely dilates and a vaginal tract that dilates poorly, and a bony outlet that is a little close, the time consumed is going to be an important factor in placenta previa. A Cesarean section in these cases, you would say, should be done for the contraction of the pelvis. Not necessarily at all. With a contraction of the pelvis, the patient may very easily go through labor if there is no placenta previa. She may go through a prolonged labor. We should give her plenty of time for the cervix to dilate and the head to move, but if there is placenta previa she cannot go through a long or protracted labor, and so I would rather think that the statement that Cesarean section should be done for no case of placenta previa is rather strong. I do believe, however, that Cesarean section for placenta previa is very much overdone in the hands of general surgically trained men. I believe that if more of these cases fell into the hands of the trained obstetricians, fewer of them would be dealt with by Cesarean section, and more of them will be handled through the natural route. I do believe that there are cases where we would save children by Cesarean section and would lose them through the natural route.

One point I wish to speak of is with reference to packing the vagina and cervix for stopping hemorrhage. That oftentimes prevents hemorrhage from coming to the outer world. A hemorrhage may be going on in the uterus. Not infrequently placenta previa is one of the causes of premature detachment of the placenta. The placenta may be prematurely detached while the hemorrhage is blocked from coming into the outer world by packing the vagina and cervix.

DR. CHARLES L. BONIFIELD, Cincinnati.—In this discussion it

seems to me that the obstetricians, for the most part, speak of Cesarean section as if it were some terrible calamity the patient was being subjected to, or as if by doing this operation we either took the woman to the valley of the shadow of death or rendered her incapable of bearing other children. Dr. Davis and other surgeons, who have done Cesarean section repeatedly, have proven to us conclusively that it is not an operation that brings such dire results in its wake. When Cesarean section was first advocated for placenta previa, I was decidedly opposed to it. I believe, as I have heard the gentlemen say to-day, that we should have more trained obstetricians, and we need them, for there is no branch of medicine more neglected in the medical schools. On the other hand, there are certain cases where I believe a skilled surgeon is better than a skilled obstetrician.

During the last year a woman came into the Good Samaritan Hospital who had been seen by a number of good practitioners, and one capable obstetrician. It was a case of placenta previa. She had been tamponed and tamponed for the control of hemorrhage. She was all bled out with placenta previa centralis, so that she could not very well stand the loss of any more blood, nor could she stand any operation that would consume any considerable time, and so instead of calling in one of my distinguished capable obstetric friends, I did a Cesarean section on her, and saved the lives of both mother and child. Could they have done better? She has her ovaries and uterus, so that she can become pregnant again.

DR. E. GUSTAV ZINKE, Cincinnati.—I would like to add a few words as the difference between the obstetrician and the surgeon. There are obstetricians who are not surgeons. I am perfectly willing that they shall continue to exist if in case of need they will send for an obstetrician who is a surgeon; but I do not believe that any man has a right to be a teacher of obstetrics and not be capable of doing every part of obstetric surgery.

DR. SCHWARZ (closing).—I thank the gentlemen for the liberal discussion, and I am in full accord with Dr. Zinke in his statement that in spite of all argument we will fail to reach an agreement.

The same question was discussed before the American Gynecological Society three years ago, and I am willing to endorse some of the opinions expressed on that occasion. For instance, Dr. Jewett of Brooklyn, said: "Grave hemorrhage in placenta previa is due more to failure in the timely and well-directed use of the obstetric measures than to any lack of them." And Dr. Newell of Boston, expresses himself thus: "The advocates of Cesarean section have not recognized that their personal limitations furnish the great indication for abdominal delivery and not the exigencies of the case."

A CASE OF FLOATING SPLEEN WITH TWISTED PEDICLE.  
CELIOTOMY. SPLENECTOMY. RECOVERY.<sup>1</sup>

BY

H. S. LOTT, M. D.,

Winston, N. C.

THE patient was a woman, fifty years of age, and unmarried. When I first saw her, she had been suffering for several hours and was in the midst of a classic group of symptoms indicating an accident to some intraabdominal organ. This group consisted of recurrent, "gripping" pain, with some tenesmus of the lower bowel, together with paroxysmal nausea and vomiting, with pallor, and shock which was marked, but of a mild degree.

A readily palpable and freely movable tumor could be easily located at rest, well over in the left flank and just beneath the floating ribs. This tumor could be carried to about any position in the abdominal or pelvic cavities without giving the patient pain, and, when freed, returned to its original location. The thickness of the abdominal wall was such that no distinctive anatomic landmarks were discernible.

The patient was removed to the hospital, and kept under very close observation for forty-eight hours. In this time the acute symptoms became less intense. The menstrual history, both before and since the climacteric, seemed uneventful, and threw no light upon the present condition. Rectal examination gave a negative result. There had been no kidney crises; and urinalysis showed a very few casts, with just a trace of albumen; while, to make the picture more mystifying, a blood analysis gave hemoglobin 85 per cent. with normal leucocytes.

Assuring the patient that in spite of the fact of her greater comfort, the condition was one to be met fairly by surgical measures alone, brought ready consent for operation with its hope for future safety.

Under ether anesthesia the abdomen was opened by an ample median incision. Tracking immediately down into the pelvis, the touch revealed a normal postclimacteric uterus, with normal appendages attached. Leaving the pelvis and invading the left

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.



abdominal cavity, the mysterious tumor was easily located just protruding from its home, and in response to gentle "teasing," with the finger tips, it came promptly forward and was delivered through the abdominal incision. Upon inspection this "wanderer" was found to be a spleen of about twice the normal size, much congested and with a twisted pedicle which had been partially released. Considering both past and future, its removal was deemed best.

The broad pedicle was tied off in sections, securing the large vessels with silk and the intervening structures with catgut and a dry, clean stump dropped back into the abdomen. Being satisfied with this pathology, little further search was made and the abdomen was closed with eight through-and-through silk-worm-gut sutures, and a dry gauze dressing applied.

For ten days after the operation there was no feature worthy of note. The nausea was somewhat distressing and pulse and temperature exhibited some slight fluctuations. On the eleventh day the dressing was opened; the incision was perfectly clean and the stitches, all dry, were removed.

On the night of the eleventh day a mild phlebitis developed in the left leg. This gave some pain for forty-eight hours, with swelling of the limb, and an elevation of temperature of one-half to one and a half degrees for about two weeks. With a bandage, absolute rest, and elevation of the limb this gradually subsided, and the convalescence otherwise was really uneventful.

About three weeks after the return to her home and just two months from the operation a careful blood analysis, made by Doctor W. M. Johnson, gave the following result:

Hemoglobin.....	80 per cent.
Leucocytes .....	15,400

#### Differential Count.

Polymorphonuclears.....	62 per cent.
Lymphocytes.....	34 per cent.
Large mononuclears.....	2.5 per cent.
Eosinophiles.....	.5 per cent.
Basophiles.....	1 per cent.

The phlebitis, which I believe was mechanical and not infective, has no doubt contributed to the increase of leucocytes, and it has also been formidably obstructive to the progress of her convalescence.

PUERPERAL THROMBOPHLEBITIS.<sup>1</sup>

BY

PALMER FINDLEY, M. D.,

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THE clinical picture of puerperal pyemia varies with the site and extent of the structures involved, with the virulence and numbers of the infecting microorganisms and finally with the tissue resistance of the host. We are all familiar with the condition popularly called "milk leg" or "white leg," which is a mild form of vein infection. A striking contrast is presented in acute puerperal pyemia where chill follows upon chill, the temperature curve presenting great fluctuations which mark the flooding of the circulation with microorganisms or their toxins, the pulse becoming rapid and feeble and the development of great prostration. All this is the clinical expression of an infection starting, as a rule, at the placental site and traveling rapidly by way of the veins of the uterine wall, thence to the broad ligaments, ovarian plexus, internal iliaes, common iliaes, downward to the femoral veins and upward to the vena cava. Into the general circulation of the blood microorganisms and infected emboli are carried to the lungs and elsewhere and death almost certainly closes the scene.

These are the two extremes of puerperal thrombophlebitis and between them are the subacute and chronic cases which are marked by delay in their onset and an insidious course. Days and even weeks may pass with no more than the local manifestations of a mild uterine infection as suggested by altered lochia, pelvic tenderness and slight rise of temperature. Even these symptoms may disappear for a time before the onset of signs of a grave infection become manifest.

Thrombosis of the veins at the placental site and in the wall of the uterus is a physiological process. This occurs to a varying degree within normal limits. Where the uterus fails to contract well, following the completion of labor, thrombosis is much increased.

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

The exposed venous sinuses at the placental site afford to the infecting microorganisms a convenient means of entrance into the circulation of the blood. However, contrary to early conceived notions, the presence of these microorganisms in the blood does not necessarily lead to a fatal issue. So far as our knowledge extends the issue is determined by the number and virulence of the invading germs on the one hand and the tissue resistance of the host on the other. It follows that the number of germs found circulating in the blood does not speak *per se* for the virulence of the infection.

The frequency of puerperal thrombophlebitis is estimated at approximately 30 to 55 per cent. of all fatal cases of puerperal sepsis. Trendelenburg found twenty-two instances in forty-three autopsies, Lenhartz thirty-two in sixty fatal cases, and Kneise twenty-seven in eighty-nine autopsies.

The veins primarily involved are the uterine and ovarian or spermatic. The uterine veins convey the blood from the upper portion of the vagina, cervix and the greater part of the body of the uterus, while the ovarian or spermatic veins convey the blood from the fundus of the uterus, tubes and ovaries. The uterine veins converge to form the hypogastric veins which join with the external iliac veins to form the common iliac vein, which in turn unite into the inferior vena cava.

The frequency with which the respective veins are thrombosed is variously stated. For example, Lenhartz found a unilateral involvement in 80 per cent. of his thirty-nine cases. In four of his cases the thrombus extended into the vena cava. von Recklinghausen states that in most of the fatal cases the thrombosis involved the ovarian veins. In all of the twenty-five cases observed by Seegert the ovarian veins were thrombosed. In nineteen of the twenty-five cases the lesion was unilateral.

These thrombi may suppurate and give rise to metastatic abscesses of the viscera. The lungs are the most frequent seat of the infected emboli arising from the pelvic veins. Less frequent lesions are ulcerative endocarditis, renal infection, gastrointestinal infection, as well as infections of the brain and meninges, joints, retina, peritoneum, skin and subcutaneous tissues. The distinctive lesion in the uterus is found in the thrombosed sinuses which lead to the veins in the broad ligament. It is not an easy task to detect the organisms in the general circulation of the blood, inasmuch as they may be wholly absent, are seldom in



large numbers and as a rule invade the blood stream at intervals.

The clinical course of puerperal thrombophlebitis is seldom acute. While the evidences of a local pelvic infection are usually found early in the course of the disease it is the rule that characteristic symptoms do not develop prior to the second week of the puerperium. It may be that in the first week of the puerperium the clinical course does not vary from the normal but, on the other hand, alarming symptoms of a general infection may follow closely upon labor. The symptoms are ushered in by a rigor followed by a rapid elevation of temperature to  $104^{\circ}$ – $106^{\circ}$  F. and a corresponding increase in pulse rate. The temperature falls to normal or near normal but the pulse will usually continue at a relatively rapid rate.

Rigors are presumed to signal the entrance of microorganisms or their toxins into the circulation. They are usually repeated at irregular intervals and may continue over a period of many weeks. Cases have been known to recover after from sixty to seventy chills. It is regarded as a hopeful sign when the rigors become less pronounced and recur at longer intervals. Having ceased to recur recovery is usually speedy. As the disease progresses the pulse becomes weaker, more rapid and compressible. Nutrition fails rapidly, the face increases in palor and icterus may develop. Diarrhea with offensive stools is often observed but vomiting is unusual. The mind may remain clear to the end but delirium may develop and deepen into a maniacal condition. Mahler says that great rapidity of the pulse speaks for a widespread thrombosis of the pelvic veins.

On examination of the pelvic organs there is usually found some evidence of infection. The uterus may be perfectly involuted but is more often soft, enlarged and somewhat tender to pressure. To one side of the uterus it is often possible to palpate the thrombosed veins which form an irregular elongated mass running from the uterus to the side of the pelvis. These findings are commonly unilateral. The presence of tenderness along the course of the femoral vein and edema of the groin and thigh are not constant findings but when present are of the highest significance.

For years the aural surgeons were ligating the jugular vein to check the advance of infected thrombi when W. A. Freund, in 1897, ligated the spermatic veins of two cases of puerperal thrombophlebitis but without success. Five years later

Trendelenburg operated five cases with one recovery. His low percentage of recoveries can be accounted for by the fact that four of them were operated in the acute stage; the one operated twenty-six days after delivery, recovered.

Bumm, in 1905, published his results in five cases of chronic pyemia. Of this number three recovered. This report gave an impetus to the procedure. Since then Fromme, Cuff, Latzke, Whitridge Williams, Lenhartz, Opitz, Osterlow, Vineberg, Miller, Huggins, and others have reported cases.

Whitridge Williams operated twenty-eight cases which he regarded as suitable. Of this number six died, a mortality of 21.4 per cent. There were twelve cases in which the thrombosis was limited to one or both spermatics and only one of this number died. Huggins operated four cases with one death.

Osterlow reported seven cases with four deaths which he ascribes to too late operating. Latzke reported thirty-seven cases operated for thrombophlebitis, of which number fourteen recovered. Michels operated three cases with two recoveries. One of the fatal cases was operated in the presence of a general septicemia. Michels collected sixty-four operated cases in the literature of which number twenty-nine recovered.

Jeff Miller finds eighty-one cases now on record. Many of the cases resulting in death should not have been operated because the disease had progressed beyond the point of ligation. In several the infected thrombi were found in the inferior vena cava. Again there were those operated in which the lymphatic invasion was well advanced, leaving nothing to be gained by ligating the veins. It is noted that in many operated cases which ended fatally the surgeon failed to ligate all of the thrombosed veins and as a rule the infection continued to spread.

Vineberg, of New York, operated a case of criminal abortion two days after the uterus was cureted. He opened the abdomen and found both spermatic veins thrombosed. These were ligated as well as the left median iliac vein. Following the ligation of these veins a panhysterectomy was done. Streptococci were found in the blood. The case recovered. Later he lost a similar case. A third case developed a thrombophlebitis five days after a normal delivery and apparently normal course. The first rigor occurred on the thirty-first day of the puerperium. On the twenty-seventh day he ligated the right spermatic vein close to the vena cava. The operation was done too late and was followed by death. A fourth case followed a spontaneous

labor. Evidences of thrombophlebitis developed and operation was performed on the fifteenth day. There were multiple abscesses of the uterus and septic thrombosis of the right spermatic vein. The vein was ligated and excised and the uterus and its appendages removed. Recovery followed.

We are admonished not to operate in the acute stage of the infection. The earliest successful case was that of Vineberg which was operated on the fifteenth day of the infection. In the acute stage of the infection there is great danger of spreading the same and at such times the low resistance of the patient would render such an operation extremely hazardous. In the acute stage the mortality of nonoperated cases is not less than 75 per cent., as compared with a mortality of 38 to 40 per cent. in the chronic stage. It may be fairly stated that the mortality of chronic pyemia has been lowered full 10 per cent. by the timely ligation of infected veins. We are admonished by Trendelenburg and Bucura to operate after the fourth chill. It is questionable if this is a safe rule of practice, inasmuch as many cases are known to recover without operation after a dozen or more chills.

The operation is clearly contraindicated where metastatic abscesses are recognized, where pus has accumulated in the pelvis and where there are distinct evidences of lymphatic invasion.

Pneumonia and endocarditis are placed as contraindications to the operation, while pleurisy and lung infarcts do not necessarily contraindicate operative interference. Where there is marked edema of the leg it is assumed that the common iliac vein is thrombosed—such cases are not looked upon as favorable for operation. Recovery is possible in the presence of a bacteriemia and death may ensue in the absence of microorganisms in the blood. It is the rule that the blood seldom contains a large number of germs and that these are not constant in their presence. Hence it follows that blood findings are of little value in determining the prognosis or the question of operative interference.

The thrombosed veins have been approached by three routes, the vaginal, the extraperitoneal and the intraperitoneal. The first and second procedure have not been generally adopted for the reason that the veins in either side of the pelvis and higher up in the abdomen cannot be under direct inspection. The technic of the intraperitoneal route is briefly as follows:

The abdomen is opened in the median line. The uterus and its appendages are inspected. Next the broad ligaments are



inspected and palpated with special reference to the course of the uterine and ovarian veins. If the broad ligaments are found to be thickened along the course of these veins the existence of thrombosis is assumed. The veins are then palpated along their course to a point above the thrombus; here the peritoneum is incised and a ligature is passed about the veins by means of an aneurism needle. Ligature of the ovarian veins may be made as high as the vena cava on the right side and to the point of union with the renal veins on the left side. Where the internal iliac vein is involved it should be ligated near to its juncture with the external iliac vein. If a median iliac vein exists this should be ligated at its juncture with the external iliac trunk. Lea recommends the ligature of both sides in every case because of the free anastomosis. The more acute the infection the more extensive the ligations. Care must be taken to prevent ligature of the ureters and lumbosacral cord.

After such extensive ligations of the veins the pelvic organs and vulva become edematous but this is soon remedied by the establishment of collateral circulation. Where the thrombus has developed into an abscess we are advised to dissect out the vein with a thermocautery.

I have had seven recent experiences with this condition. My first patient was in the Clarkson Hospital for a period of two weeks before her death. There were unmistakable evidences of metastatic involvement of the right lung when she entered the hospital, three weeks after a miscarriage at the seventh month of gestation.

She had fully a dozen chills before she entered the hospital and an equal number during her period of two weeks in the hospital. Her temperature ranged from subnormal to  $106^{\circ}$  F., the pulse from 120 to 180 and the respirations from thirty to fifty. Icterus developed a few days before death and there were occasional periods of delirium. There was no abdominal distention or tenderness. The uterus was well contracted, not tender and was freely movable. To the right of the uterus could be felt a doughy elongated mass in the broad ligament.

The postmortem findings were most instructive. The uterus presented a normal appearance for the fifth week of the puerperium with the exception of a plastic exudate covering its external surface. To the left of the uterus there were no thrombosed veins, but on the right side both the uterine and spermatic veins were thrombosed. The thrombosis in the uterine veins did not extend above the broad ligaments while the spermatic

formed a rope of veins about one inch in diameter and extending to its union with the vena cava. The lower portion of the vein contained a firm blood clot while the upper portion was filled with pus which had freely discharged into the vena cava. On the wall of the vena cava at the entrance of the right spermatic vein was a mural thrombus but there was no closure of the lumen of the vena cava.

There were multiple abscesses in the right lung with about two quarts of pus in the right pleural cavity. One or more of the abscesses had ruptured into the pleural cavity. The peritoneum and uterine appendages were not involved nor was there an evident lymphatic invasion.

It is evident that there *was* a time in the course of this infection when a ligature placed above the advancing thrombus in the right spermatic and around the right internal iliac vein would have effectually blocked the advance of the infection but in reviewing the history of the case, in the light of the postmortem findings, I am unable to say when that time was and I seriously question if any one would have been justified in interfering surgically at any time in the course of the disease because of the rapidity with which the disease developed. In other words the opportunity was there but who could have recognized it?

Shortly after this experience I fell heir to another case of puerperal pyemia which ran a more chronic course and in which there was no evidence of metastasis. I believed this case was loosing ground and in the absence of any demonstrable contraindication I made an exploratory incision in the hope of finding conditions favorable for the ligating of thrombosed veins. This was three weeks after the initial chill and she had had ten to twelve chills. Findings were negative everywhere. There were no thrombosed veins that I could recognize and the abdomen was closed after placing a ligature about the spermatic veins of both sides. This procedure did not depress the patient but certainly did her no good for she subsequently had numerous chills and metastatic abscesses developed in the right lung with pus in the pleural cavity which was drained. This case ultimately recovered.

My third experience was in a case in which there had been a miscarriage at the third month of gestation three weeks before I saw her. I drained a pelvic abscess to the left of the uterus. Two weeks later the left lung was invaded by infected emboli, and in another week the right lung was invaded. She died ten weeks after the miscarriage. A postmortem examination made

by Dr. Dunn of Omaha demonstrated that the infection, which was due to a short chain streptococcus, was conveyed from the uterus by three separate avenues.

First the infection spread by continuity of tissue from the uterus through the tubes to the pelvic peritoneum, developing an abscess behind the uterus and a general plastic exudate over all the pelvic organs. The general peritoneal cavity was not invaded.

Second the infection spread by way of the lymph channels of the uterus and broad ligaments and resulted in an enlargement of the lymph nodes throughout the abdomen.

Third, the infection spread through the veins on the right side, involving both the hypogastrics and spermatics, the internal, external and common iliac veins. Most of these veins were distended with pus. On the left side the hypogastrics and internal iliac were thrombosed.

This condition was clearly a contraindication to the Trendelenburg operation because of the general lymphatic invasion if for no other reason.

My fourth experience was in an apparently typical case which had persisted three months and which promptly reacted and recovered after the administration of mixed vaccines.

Cases five, six and seven were observed subsequent to the reading of this paper. They were almost identical in their clinical manifestations and postmortem findings. In all three the infection followed full-term deliveries, there was no instrumental interference in any of the cases but the attending physicians had made one or more digital examinations in the course of labor. No metastasis developed and in two of the cases the right spermatic veins alone were involved while in the third the left spermatic, left uterine, internal iliac, common iliac and external iliac veins were thrombosed and the left femoral vein was distended with pus to the level of the knee. All three died.

In none of these cases was operation attempted and in the light of the postmortem findings I am persuaded that it would not have been wise to have interfered surgically.

I am not prepared to take a definite position for or against the procedure of Trendelenburg, but will submit the following propositions for your consideration.

1. The operation of Trendelenburg is correct in theory but is as yet in the experimental stage.
2. It is contrary to my practice and to modern teaching to open the abdomen in the course of puerperal infection unless for



drainage in general peritonitis and we therefore view the suggestion of Trendelenburg with misgivings.

3. We are as yet unable to demonstrate clinically the extent to which the infection has traveled, hence it follows that an exploratory incision must be the final resort in determining the extent of the infection, and even this means may fail to give the desired information.

4. The pelvic veins including the iliacs may not be thrombosed and yet the infection may attack the veins higher in the abdomen, beyond control and even beyond inspection through an exploratory incision. Furthermore bacterial emboli may develop in the lungs and elsewhere without the formation of thrombosed veins.

5. The thrombosed veins may be secured and the infection later travel by other avenues and lead to a fatal issue.

6. It is not always possible to demonstrate the presence of infected emboli which, when found, are viewed as contraindications to operative interference.

7. We believe the Trendelenburg operation will find a limited field of usefulness in obstetric surgery, but that the procedure is worthy of an extended trial.

418 BRANDEIS THEATRE BUILDING.

## AN ABDOMINAL CASE OR TWO OUT OF THE ORDINARY.<sup>1</sup>

BY

AP MORGAN VANCE, M. D.,  
Louisville, Ky.

(With Four Illustrations.)

THIS short paper will simply relate, rather in abstract, four cases which I hope are sufficiently out of the ordinary to justify their report.

**CASE I.** *Extensive Bladder Rupture; Eighteen Hours between Injury and Repair; Recovery.*—In July, 1908, I was called to attend Mr. M., a young man of fine physique, who sustained a fall of 20 feet or more, in which he, with six companions, was carried over a defective bridge in a large automobile. After recovering from the primary shock, he suffered great pain in the lower abdomen, with inability to void urine. Morphine was given him and the catheter relieved him of blood and urine. The bladder was irrigated two or three times, the irrigating fluid finally coming away clear. Sixteen hours after the fall I saw him, after being brought twenty miles to the city in an automobile. At this time he gave every evidence of beginning

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists, at Toledo, Ohio, September 17-19, 1912.

peritonitis, with fast pulse and rising temperature. Immediate operation was advised, a tentative diagnosis of rupture of the bladder being made. Upon opening the abdomen a large quantity of blood clots and urine escaped, and the first stages of an active peritonitis were evident. A wound, quite 4 inches long, was found in the bladder vault, extending to within an inch of the posterior reflection. Quite a coil of the small intestine had become herniated into the bladder. This portion showed more advanced peritonitis. It was decided at once that primary closure of the large rent was out of the question. After cleansing the pelvis of the clots and urine by gentle sponging only, the parietal peritoneum was carried down and sutured with catgut to the posterior angle of the bladder rent, then a suture continued around either side, closing the bladder opening off from the cavity and thus rendering it extraperitoneal. A large glass drain was placed back of the bladder to the bottom of the pelvis; also two large rubber-covered gauze wicks. A large catheter drained the bladder from above. The glass drain was removed in eighteen hours; the gauze in forty-eight hours. The catheter acted perfectly for eleven days. At the end of four weeks, urine passed by the natural channel and this young man made an ideal recovery in a comparatively short time. He was placed in the Fowler position and saline injections by the rectum were kept up for five days. The wound healed primarily down to the drains and is now firm and strong throughout. The patient has been in perfect health and none the worse for his terrible experience up to a second accident which occurred in the last few months.

Dr. Louis Frank saw this case with me and was present at the operation. The conduct of the case during the first sixteen hours was in other hands, and the bladder irrigation was done before I saw him.

CASE II. *Epispadic Extrophy of Bladder; Autoplastic Repair; very gratifying Result.*—At the meeting of the American Medical Association at Atlantic City, in June, 1900, I reported a successful case of epispadic bladder extrophy, and exhibited the patient, a young man then twenty years of age, one year after the finished operation and three years after the first operation. His case has been proven by time to be far more successful than I ever dreamed of. This young man has been able to conduct a large mercantile business for ten years, is married, and from every standpoint, the marital relation as well as otherwise, is most prosperous and happy.

Case II is a counterpart of the one referred to above, and just as successful.

This boy, æt. twelve, was sent to me by Dr. Otto C. Baumgartner, of Rockport, Ind. He was well developed for his age, was dressed like a girl, and consequently sprinkled the earth wherever he went, an object of absolute misery. He was placed in the Children's Free Hospital, in Louisville, June 7, 1907,

and after spending eighteen days getting the part into the best condition possible, the first attempt at repair was done on June 25, nearly three weeks being required to improve the local condition and get rid of the calcareous deposits about the parts.



FIG. 1.—Case II.



FIG. 2 —Case II.

The epispadic penis was very short and drawn back into a sulcus at the lower part of the opening. The posterior bladder wall, with discharging ureters, presented a convex surface far in front of the abdominal plane, about the size of the half of a baseball



or larger. When recumbent or in the Trendelenburg position, a concave sulcus of corresponding dimensions presented.

The first step in the operation was to separate the skin from the mucous membrane on either side of this sulcus, down to the end of the flat penis, one-third of the circumference at the top being left. Then, by careful dissection, I loosened up the overlying pudendal tissues. This dissection was done with the finger



FIG. 3.—Case II.

and was carried well out toward the groin. Then with strong forceps making traction upward and inward, I still further loosened the tissues thus freed, bringing the mucous membrane along with the skin. When this loosening and stretching had been done sufficiently to allow the separated pudendal structures to be brought together in the middle line, they were closed with two sets of sutures; one line of buried chromicized catgut No. 1, which inverted the inner or mucous membrane side, and another

of interrupted silkworm gut, which everted the outer or skin side. Over this a dressing of collodion and cotton was applied. The button-hole-like opening above was used to drain the urine away, the patient being required to maintain the Trendelenburg position. No good resulted from this operation, except probably the piling up of tissue to be used to better advantage at the next attempt.

Six other operations were done during the eighteen months following, and finally, as in the young man previously mentioned, closure was completed, the same flap-splitting method being used, each time gaining something. The new bladder has now been performing its function for two and one-half years and is in a perfectly healthy condition. The penis has developed quite a good deal. Of course an ordinary urinal is necessary to gather the urine, although at night four or five ounces are retained and passed on arising.

In this kind of work much patience is required, both on the part of the patient and the surgeon, and many difficulties are to be overcome, principal among which are, the great tension on the sutures, the septic surroundings, the difficulty of drawing away the urine, and the constant lack of rest of the parts due to the tendency to erections. Notwithstanding all the difficulties, the benefits justify one in the efforts at autoplasmic work.

I still hold the same opinion as to the propriety of autoplasmic work that I did when reporting the case of the young man; that is, when the patient is a male. In females, the transplantation of the ureters into the intestine is the only thing to do. The only one I have tried, however, died promptly from ascending infection.

Of course, reference to the technic of Maydl's or Peters' operation is unnecessary here, as every one is familiar with them. One or the other, according to the indications, should be used in the female, always bearing in mind the possibility of disastrous results, both primarily and secondarily, particularly in the hands of the rank and file of surgeons.

*CASE III. Operation for the Relief of the very Distressing Bladder and Bowel Complications of Late Locomotor Ataxia.*—Mr. S., æt. fifty, came under my care July 6, 1908. Two years previously he had consulted me, begging that something surgical be done to render his existence less terrible. This history was obtained: He had acquired syphilis twelve years before, for which he had been treated in rather a careless way. For three years he had shown symptoms of tabes, which had progressed rapidly until he was the most forlorn and miserable mortal I believe I had ever been called upon to treat. He was emaciated to the last degree; had acquired the morphine habit and was taking 10 to 20 grains a day. Was on crutches because of his

ataxia and a Charcot right ankle and arch of foot. He did not seem to fret about little things like these, but his main misery was in the almost impossibility he experienced in getting his bladder and bowels to act. This was accomplished only by the most strenuous tactics. In wintertime, when snow was plentiful, he could manage with less trouble, but at other times, as a substitute, he used a large tub filled with ice and water. The most drastic purgatives were a part of his daily diet. He would double up like a jack-knife and sit in the bank of snow, or in the ice-water, the refrigeration being necessary to give him power, after the greatest effort, to first empty the bladder and then the bowels, or *vice versa*, I forget which. With all this to hamper him, his courage and desire to care for his family enabled him to continue in charge of a large school. Upon his first visit I could not see anything to be gained by surgery, and frankly told him so. He returned home and I did not hear of him again until the above date, two years later. His condition was then more dreadful in every way, if this was possible. He came, he said, to get relief, and if this was impossible he had decided to commit suicide. I again declined to attempt any surgery, but, happening to find him going through his efforts to relieve his bladder and bowels, I told him I would open the abdomen and see what I could do to overcome the very exaggerated ptosis of bowel and bladder. The sphincteric musculature seemed to be but little affected, but the power to empty either the bladder or bowels voluntarily was nil, and the straining in the effort was dreadful to behold. Without the hope of anything better than a funeral, I opened the abdomen, under chloroform, from the umbilicus to the pubes, and carried out the following procedures:

The bladder was perfectly flaccid and very large. Quite a bunch of urachal remains could be made out. This part was grasped in forceps and the viscus pulled up out of the wound. It looked about like a handkerchief, caught in the middle and pulled through one's fist, reaching well above the umbilicus. I immediately sutured the top of the bladder along the median line, above the umbilicus, with long-lived catgut, then sought the large gut and finally did a colopexy, firmly stitching the sigmoid to the loin. All of the small intestines, along with the bladder, seemed to be packed and crowded toward the pelvic outlet. The abdomen was closed and the man, more dead than alive, was put to bed. He quickly reacted and made a rapid recovery, the Fowler position being maintained in order that the urine might gravitate to the neck and be voluntarily voided.

He returned home in three weeks and lived for three years, being able to empty his bladder and bowels without difficulty, being always compelled, however, to assume the proverbial fence-corner position, but whether this was habit or a mechanical necessity I do not know. He finally died by accident.

He continued to teach with only slight loss of time, until his death. His ataxic symptoms progressed and he had crutch



palsy and several posthypodermic abscesses during this time. However, he did not mind such things as these as long as he could be free of the bladder and bowel difficulties. Under date of April 15, 1909, he wrote me a letter of thanks for the relief he had experienced following the operation. He detailed the inter-current troubles mentioned above, but said:

"As far as the operation is concerned, I am infinitely relieved. Since the abscesses got well I have had but little trouble. The stools are molded and I use nothing to induce the movement. I can hold water for six hours without inconvenience, and pass

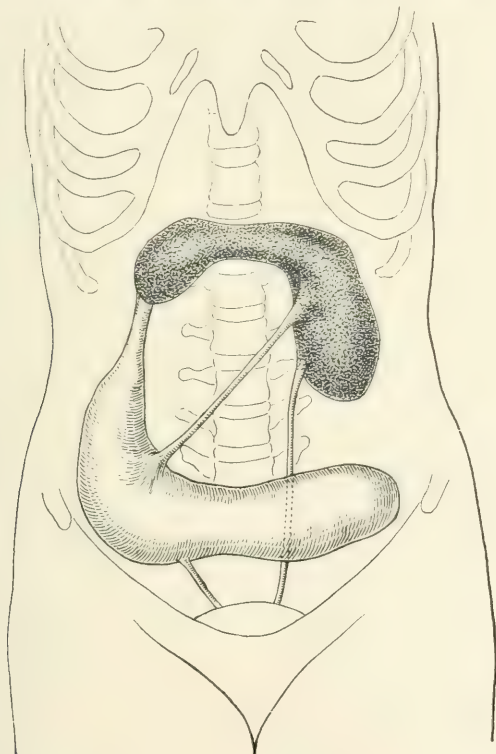


FIG. 4.—Case IV.

it without much trouble, but I have to assume the squatting position. I have not given up yet, even if life has no pleasure in it, but I could not have stood it without the carving you did. That was surely successful, and but for this awful locomotor business, I would be sound and well."

CASE IV. *Large Hydronephrosis; Horseshoe Kidney; Congenital Anomaly of Ureter; Transperitoneal Nephrectomy; Cure.*—Patient, B., male, æt. sixteen, the son of a tobacco tenant, was brought to me August 1, 1909, by Mr. R. O. Williams, of Ghent, Ky. He came to be treated for an enlargement of the abdomen.

After careful examination I diagnosed a large cyst, springing from the kidney. The cyst filled the right side of the abdomen and extended into and across the pelvis to the left iliac fossa. I had no history to help out the diagnosis as Mr. Williams knew none. I did not see this boy again until August 9, on the operating table, as a belated steamboat had landed him, accompanied by his family physician, Dr. H. S. Rowlett, of Carroll County, Ky., in Louisville late the night before. I made an incision along the outer border of the right rectus muscle, 5 inches long, down to the cyst wall, the posterior and anterior peritoneum were clamped together, thus rendering the subsequent work practically extraperitoneal. The bulging cyst was tapped and five pints of amber-colored fluid drawn off, to all appearances perfectly fresh urine, leaving about one-fourth of the contents in the sac to facilitate the enucleation. This was begun. The separation of the sac wall accomplished with little difficulty. I soon came to the right ureter at the bottom of the sac in the pelvis. This was cut between clamp and ligature, and the separation continued over into the left iliac region and up the left side of sac. To my great surprise I came upon another tube running from the sac across the spinal column to the left. I immediately verified the existence of a left ureter, finding one of good size. I traced this short, thick tube to the very large left kidney. It came away near the normal ureter. I tied it off, ligating it as near the kidney as I could, clamping the part nearer the cyst. My greatest trouble was yet to come—I mean trouble in deciding what to do, as I had fallen into new fields—anyway, new fields to me. The enucleation was continued upward, under the ribs, and the upper part freed and brought down, revealing a small kidney, about the size and shape of an English walnut, with a broad, thick band of kidney tissue connecting it with the hypertrophied left kidney. I hesitated for a moment, as the blood supply of this little kidney looked so large that I feared it might be serving both. I had to go ahead, as backing out was out of the question. After ligating the vessels and the connecting band with catgut, the whole growth was removed and the wound closed without drainage.

After two days it was difficult to keep this chap in bed. On the eighth day he was walking about the hospital and returned home on the tenth day. He has been perfectly well ever since.

A little history, obtained from the mother later, was interesting. The boy, five years before, had been kicked by a mule in the right side, but the tumor had been observed before this injury. It had been noticed that, on rising, he would void a tremendous quantity of urine, and then, in a very short time, would pass as much more. When asked if the tumor would vary in size, she replied; "O, yes; at times it was very much smaller." This proved to me that the sac would fill up by secretion from the left kidney, probably when the boy laid on his right side, and the urine would

flow back into the pelvis of the large kidney when in some other position, filling the bladder rapidly through the left ureter.

Drs. McMurtry, Sherrill and Frank, members of this Association, saw this specimen when it was exhibited before a local society. It was, unfortunately, lost by the family doctor who begged for it to show to his own county society. The accompanying drawing from memory gives a very fair idea of the mechanics of the case.

#### DISCUSSION.

DR. JULIUS H. JACOBSON, Toledo, O.—I wish to say a word regarding my experience with three cases of exstrophy of the bladder in which an implantation of the ureters into the rectum was made. The first case was a man thirty years old, who had twenty-seven plastic operations performed for the relief of his exstrophy, all without avail. I saw him after he had attempted suicide. I proposed the operation of implantation of the ureters into the large bowel. This operation gave him three years of life which he really enjoyed. He eventually died of ascending infection, or rather from an acute exacerbation of the infection of the kidneys which was present previous to the implantation. The second case was a boy eight years of age. In this case we did a Peters or Bergenheim operation, the extraperitoneal method of implanting both ureters into the rectum. The operation has been quite successful in this case. He is alive at the present time, the operation having been performed about five years ago. For about a year after the operation he had very frequent discharge of urine from the rectum, which I think was due to the fact that we had implanted the ureters too near the sphincter muscle. At the present time, however, he is gaining in control of the urine and is getting along comfortably.

In looking over the literature of this subject, and in particular the literature pertaining to the congenital communications between the ureters, bladder and rectum, I came across a few cases in which the ureters were congenitally placed in the rectum. In some cases the patients lived quite a long time. I think it was the elder Gross who reported such a case, a man who lived to be almost forty years old, showing that a tolerance for the colon bacillus may be developed by the urinary tract. In thinking the matter over, I resolved that if I should get another case of exstrophy soon after birth, I would do an immediate implantation of the ureters into the rectum. The opportunity came to me and I did the operation again after the method of Peters and Bergenheim but the patient died of ascending infection, within a few days.

I think Dr. Vance is to be congratulated on the very excellent result which he obtained in his case of exstrophy of the bladder. Intestinal implantation, for exstrophy of the bladder I believe will always hold a place in surgery.



DR. VANCE (closing the discussion).—I failed to mention that the bladder in both cases was lined with mucous membrane. There was no hair-bearing tissue turned into it, as was formerly done in almost all autoplasmic operations, thereby furnishing nuclei for calcareous deposits.

In the first case, the penis was restored in such a way as to conduct the urine down into the urinal in a normal comfortable way. The patient could retain urine up to 4 or 5 ounces at night. This young man consummated marriage and is happy in his marital relations. So far as I can discover this is the first time such a gratifying result has been obtained.

## POTENTIAL CANCER OF THE BREAST.<sup>1</sup>

BY

MILES F. PORTER, M. A., M. D.,

Surgeon to Hope Hospital; Professor of Surgery in the Indiana University School of Medicine, Fort Wayne, Ind.

(With Three Illustrations.)

In a paper entitled "The Rôle of Surgery in Preventive Medicine",<sup>(1)</sup> read at the St. Louis meeting of the A. M. A., June, 1910, I said:

"I have seen sarcoma engrafted on a fatty tumor of the elbow in an elderly woman. The tumor was situated on the flexor side of the joint where it was many times daily subjected to pressure. What surgeon of experience but has seen many cases of carcinoma or sarcoma commence in warts, moles, eczematous patches and fissures? It is my firm conviction that by timely surgery cancer could be prevented in a large number of cases. Most of the cases of cancer cured by surgery are those which are cured before they come, plus those which are cured before the diagnosis can be made save by the microscope; and herein lies the cause of the cancer quack's continued popularity: "Didn't he cure Belinda Brown of a cancer which commenced just like that one that killed Sarah Smith?" The point which I wish to make is this: that by removing causes of irritation in the shape of gastric ulcers, lacerated cervixes, phimosis, gallstones, kidney-stones, warts, moles and other nonmalignant tumors and causes of irritation, surgery can prevent more deaths from cancer than it can by the removal of cancerous conditions after such a diagnosis is possible. I venture to suggest here an addition to our cancer vocabulary, viz., potential cancer."

Ljunggren<sup>(2)</sup> in 1898 showed by experiments that epithelial cells could be preserved in ascitic fluid, and that these cells,

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

transplanted after being preserved as long as three months, not only grew but penetrated granulation tissue after the manner of carcinoma.

The prevailing view as to the origin of cancers is that they develop from rests which have been detached in process of development or as a result of inflammatory changes or abnormal involution.

That irritation of glandular epithelium by microorganisms and particular protozoa will excite it to multiply is well known.

It is a matter of common observation that carcinoma is much

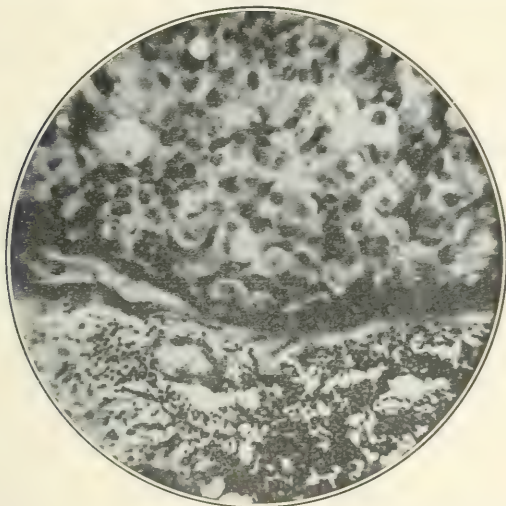


FIG. 1.—Duct cancer with inflammation. (Specimen from Case I, Miss K.;  $\frac{1}{8}$  obj. Rhamy.) Note the cancer area in the upper left side of the picture separated from the inflammatory area below and to the right by a broad band of fibrous tissue.

more prone to arise in organs, the seat of chronic inflammatory changes than in those thoroughly healthy.

So far as our knowledge goes at the present time, there is no such thing as a cancer cell that can be recognized microscopically. A group of epithelial cells that are normal and well behaved to-day may to-morrow take on cancerous activity. And especially is this malignant change apt to occur in cells that have been detached by inflammatory or other pathologic processes.

Tissue cells remind me of certain people—when at home under the restraining influence of family and friends they are models in deportment, but let them get away from home and subject them to unusual excitement and they “go bad.”

According to Sutton(3) it is impossible to decide from a microscopic examination whether a given tumor should be called a cancer or an adenoma.

Rodman(4) says that papillary cyst adenomas of the breast should be looked upon from the beginning as potentially malignant.

The investigations of Willson and MacCarty at the Mayo clinic show that cancer of the gall tracts and cancer of the stomach are frequently engrafted upon old inflammatory lesions.

Surgeons not infrequently see cases of breast trouble in which the clinical findings are decidedly in favor of a diagnosis of an inflammatory lesion but which, on microscopic examination, shows carcinoma with inflammation.

CASE I.—Miss K., æt. forty-eight, school-teacher, presented herself with a small ill defined lump in her left breast, which was painful and tender. The breast was removed, and after examining the sectioned lump with the unaided eye, it was handed to the pathologist to be immediately sectioned and reported upon, as is my invariable rule in breast tumors. So sure was I that the trouble was inflammatory that I proceeded to close the wound and had the work nearly done when the report came in—"malignant," and I had to do a radical operation.

The fact is that in this case we had associated two pathologic processes, *i.e.*, inflammation and carcinoma (Fig. 1). Exactly what the etiologic relationship of the two processes in this case it was impossible to say.

In some cases of cancer of the breast there is no tumor, and the only symptom present is a discharge of fluid which may be either bloody or serous.

CASE II.—Mrs. L., wife of a doctor, æt. thirty-nine, mother of three children, presented herself with a breast that had been leaking a bloody fluid for some weeks. There was no tumor and no pain. The breast was removed, and on microscopic section adenocarcinoma was found (Fig. 2).

CASE III.—Mrs. P., æt. fifty-five, also the wife of a doctor, mother of seven children, presented herself with a breast leaking a bloody fluid. She had a small abscess in this breast twenty-eight years before, which had healed promptly after it was opened. There was neither pain nor tumor, although the breast was slightly tender. The breast was removed, and on section nothing but inflammatory trouble was found.

On the other hand, a breast may be the seat of a tumor, and leak, and present a retracted nipple and yet not be carcinomatous.

CASE IV.—Mrs. R., married, multipara, æt. thirty-five. Breast the seat of a well-defined lump. The nipple was retracted



and leaking a serous fluid. The areola was eczematous. An examination of the specimen after removal showed the trouble to be inflammatory.

Youth is not exempt from carcinoma, particularly in the presence of trauma, bacteria or other agencies known to act as excitants to cell activity.

CASE V.—Miss B., æt. seventeen, presented herself with a small lump in her breast which was noticed immediately after an injury received two years before.

Examination after removal showed the growth to be “commencing adenocarcinoma.” In his report on the specimen the

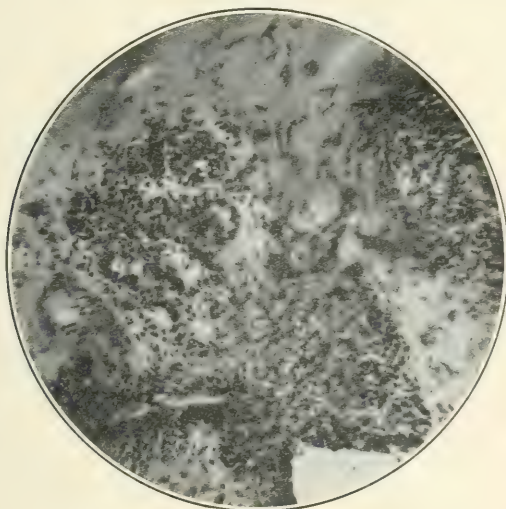


FIG. 2.—Duct cancer with inflammation. (Case II, Mrs. L.;  $\frac{1}{5}$  obj. Rhamy.)  
Note the cancer areas surrounded by inflammatory products.

pathologist (Dr. Rhamy) further remarked that it looked as though “it might have been formerly a canalicular adenofibroma” (Fig. 3).

In a paper published when this paper was nearly finished Bloodgood, speaking of bone sarcoma, says:

“Many investigators, both clinical and experimental, have been interested the last few years in the possibility of a pre-cancerous lesion; by this is meant a visible, palpable lesion of a benign nature, either a benign tumor or an inflammatory focus. In this benign lesion, experience teaches, there is a possibility of a malignant degeneration. Apparently all agree that cancer usually begins in such a lesion, rarely, if ever, in normal epidermis or mucous membrane. In most instances the benign lesion is

recognizable and always easily removed. Why not, therefore, be on the lookout for such lesions? If these were removed, might we not expect a great decrease in the number of cancers of the skin and mucous membrane?"

What Bloodgood says of bone is equally true of all other tissues and organs of the body, including the breast.

I want to emphasize the fact, however, that in case of the breast the lesion is not always palpable. (Cases II and III reported above.)

Tumor formation is a late manifestation of cancer, albeit in many situations the earliest that can be appreciated. In the

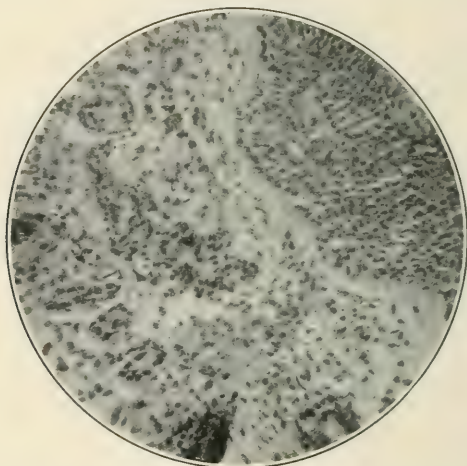


FIG. 3.—(Case V, Miss B.;  $\frac{1}{5}$  obj. Rhamy.) Duct cancer with chronic inflammatory connective tissue hyperplasia. Note the cancer cells filling and dilating a duct in the upper central portion of the picture. In the lower two-thirds of the picture are several normal ducts surrounded by hyperplastic connective tissue.

breast, however, the first sign of cancer may be an abnormal secretion or a retraction of the nipple.

My object in writing this paper is threefold: 1. To show that benign tumors and such pathologic changes in the breast as result from chronic inflammation, abnormal involution (fibrous and granular hyperplasia with retention cysts), and trauma, are potentially cancerous. 2. That actual cancer as demonstrated by microscopic examinations may be present without palpable tumor formation. 3. That the only way to differentiate between potential cancer and actual cancer is by microscopic examination.

Granting that my object has been achieved then the following conclusions seem inevitable:

1. All potential cancers require excision.
2. All demonstrable cancers require radical removal.

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- 207 WEST WAYNE STREET.

## DISCUSSION.

DR. CHANNING W. BARRETT, Chicago.—In relation to the subject of Cesarean section for placenta previa it might be well to call attention to some points in the histology and pathology of implantation as they explain the reason for excessive hemorrhage. The Müllerian tract has become divided by specialization of work into ovum-carrying portions—the tube, cervix and vagina, and the ovum-developing portion, the uterus. When the ovum becomes attached to the tube or cervix it finds these tissues ill prepared to resist the destructive and corroding action of the trophoblastic cells of the embryo and these tissues are invaded so that in case of placenta previa we are dealing not only with early separation but with difficult and destructive separation. Cervical tissue tears instead of dilates and hemorrhage is profuse. Not only must we consider the amount of separation and the degree of laceration, but we must count the element of time important. Dr. Schwarz takes the extreme ground that no case of placenta previa *per se* should receive Cesarean section, but cases are seen in which a labor prolonged by a rigid cervix, undilated soft parts, or a slightly contracted bony pelvis would introduce an element of danger not encountered in cases in which delivery could be accomplished rapidly and easily. Any or all of these difficulties might be overcome by a prolonged labor, but a labor of this kind would mean possible or probable death because of the placenta previa and therefore Cesarean section might be chosen. I believe, however, that Cesarean section for placenta previa is likely to be overdone in the hands of the surgically trained man. I believe that if more of these cases fell into the hands of men obstetrically as well as surgically trained, fewer of them would be dealt with by Cesarean section and more of them would be handled successfully through the natural route. Yet I would emphasize that there seems to be a place, although limited, for Cesarean section in placenta previa.

I wish further to say with reference to packing the vagina and cervix for control of hemorrhage, that oftentimes packing merely prevents hemorrhage from coming to the outer world. A hemorrhage may still be going on in the uterus. Not infrequently placenta previa is one of the causes of premature detachment of the placenta and in that case hemorrhage may continue and the uterus dilate in spite of the packing.



DR. ASA B. DAVIS, New York.—Accouchment forcé has been tried, and it was the method of delivery before Cesarean section had reached the position which it now holds. Our experience with that method of delivery has been that while the cervix is dilated, more often it is lacerated. We do not resort to dilatation in these cases, to any great extent, as the laceration or traumatism is very severe. There is no doubt about that in our minds. We start the laceration before the child is delivered. In delivering the child in our experience the laceration has extended beyond the point at which we begin to deliver the child, and often it has extended so that large vessels are torn through or rupture of the uterus occurred. In some instances we used to rely upon packing the uterus and packing the lacerations. We can pack these women so that hemorrhage will be checked for possibly an hour. By that time the packing has become wet at the site of the bleeding and ceases to exert pressure. The packing is usually taken out. The hemorrhage goes through the packing that is already in. The packing is taken out and replaced by dry gauze. In a number of cases, the patients have died from hemorrhage and shock. In the cases reported very often we find that the cervix, the pelvic floor and sphincter are lacerated. With our present knowledge we can enter the uterus from above and make a clean cut wound. We know the dimensions of it. We can close it quickly in a clean surgical way, and the cervix is left as it was before we began.

As to the necessity of the practitioners who are isolated and are distant from help, I will say that the means of communication with small hospitals has developed to such an extent that help can be had in the majority of cases, and I believe very thoroughly in cases where we have to deliver rapidly that Cesarean section is the preferable operation, and that abdominal Cesarean section has a decided advantage over the vaginal operation. Through the vagina we can deliver the child quickly, but it is another matter, as I have experienced, to close the wound and secure good coaptation. In subsequent deliveries if we resort to vaginal Cesarean section, those old scars are very much more apt to tear.

DR. CHANNING W. BARRETT, Chicago.—With reference to the question of colpotomy as a means of diagnosis of extrauterine pregnancy, I must admit that I recognize the difficulty that we may occasionally encounter in making a diagnosis when there is no hematoma present nor any considerable enlargement of the tube, but we should be very cautious in making a colpotomy for diagnosis. There are cases on record in which patients have died suddenly from hemorrhage excited or permitted by vaginal exploration. If this method is chosen for diagnosis the patient should always be ready for immediate celiotomy. We should be very careful to teach men that vaginal puncture is not a safe means of diagnosing extrauterine pregnancy outside the hospital or without the above preparations.

I cannot look favorably upon vaginal celiotomy as a means of reaching and removing extrauterine pregnancy.

I have made the mistake of operating upon one case for supposed extrauterine pregnancy and found an intrauterine. Briefly a number of diagnoses had been made. I saw her outside the city and without opportunity for further observation which, in doubtful cases, is a great misfortune. Extrauterine pregnancy of three and one-half months was diagnosed. The uterus seemed to be felt running up from the vagina the normal distance and separate from the mass; the normal expansion was observed in this supposed uterus. Celiotomy discovered a normal pregnancy but a very long expanding cervix with a pendulous uterus. Unusual outlines were presented by the presence of twins, this being the third pair of twins of this mother. She went to term without further incident.

DR. WILLIAM SEAMAN BAINBRIDGE, of New York City, said the "dead house" or the cancer hospital is the place to study the end results of the treatment of cancer of the breast. During the past nine years he had seen hundreds of cases, many of which had been variously diagnosed and variously treated before coming to the cancer hospital for operation. Fortunately, many cases are seen early; many more, however, are seen when it is too late for more than palliative surgical intervention.

Inasmuch as every cancer begins as a benign growth, or has its origin in some general or localized metabolic abnormality, too much emphasis could not be placed upon the early removal of "lumps" and "bumps," and upon the correction of all errors of metabolism. It cannot be predicted how soon a benign tumor may become malignant. Retraction of the nipple and secretion are not necessary accompaniments of malignant neoplasms of the breast. He had seen many cases of undoubted cancer of the breast, as witnessed by subsequent microscopic examination as well as by clinical symptoms, in which there was no retraction of the nipple, and no secretion. Too much emphasis, however, must not be laid upon microscopic examination, for some cases may be said to be clinically malignant and seemingly pathologically benign. The converse may also be true. A negative report may be of little value. If one could depend upon the examination of a half dozen or even a dozen slides in making a diagnosis it would be very well; unfortunately, however, it is sometimes necessary to study many more slides before one can definitely determine by this means whether a neoplasm in its early stage is malignant or not. It sometimes occurs that a surgeon, upon clinical evidence, removes a breast, has the pathologist report "no malignancy," demands further examination, and later receives a final verdict of "active malignancy." The speaker has had repeated experience of this kind. In a few instances, some years ago, he had been guided by the negative microscopic rather than by the clinical picture, leaving a tumor pronounced benign by the pathologist, only to see the patient die, within a few months, of general carcinosis. The cancer should be cut out—not cut into—if a cure is to be expected. In this connection

the speaker referred to the statement made by Czerny at a recent International Congress, to the effect that it might be different for others, but for him to cut into a cancer, without immediately removing it, hoping to cure the patient, violates the dictates of his own conscience.

## SOME OBSERVATIONS ON ECTOPIC GESTATION WITH REPORT OF EARLIEST RECORDED TUBAL OVUM.<sup>1</sup>

BY

SAMUEL W. BANDLER, M. D.,

New York City.

(With Seven Illustrations).

A YEAR ago a hospital case was under my observation for several days. From the history, one of the conditions which had to be considered in the differential diagnosis was ectopic gestation. Examination showed some enlargement but no sensitiveness of the tube. There was so little that was characteristic of tubal pregnancy that no definite diagnosis was made. This patient, as is the case with many patients with this history, was kept under observation for ten days to two weeks, and was examined on at least two subsequent occasions. The mass seemed smaller on each examination. The patient seemingly improved; a diagnosis of slight tubal inflammation was considered justifiable. The patient was allowed to leave the hospital. She came back after an interval of two weeks and was operated upon for internal hemorrhage due to the previously unrecognized (not diagnosed) tubal gestation. I made up my mind that an occurrence of this sort should never happen to me again; that in every doubtful and suspicious case, instead of waiting and watching for several days for further symptoms to manifest themselves, I would make a vaginal incision and learn whether any blood was present in the peritoneal cavity or better still, see with my own eyes the exact condition of the tubes. In many of such cases kept under observation, further internal bleedings of a greater or less degree make the diagnosis definite by producing or organizing an hematocele or by producing a hemorrhage of such an active nature that constitutional symptoms result. The symptoms of hemorrhage vary with the indi-

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.



vidual. The signs of shock are not always in proportion to the amount of blood in the abdomen and not always in proportion to the rapidity of the hemorrhage. I recall a case where the patient's previous history and local findings made the presence of an ectopic gestation certain, yet I had the greatest difficulty in persuading the physician to permit me to take the patient to the hospital for observation. On reaching the hospital her color, and not her general condition, warranted an immediate operation; yet her pulse was only 80, and true to the promise that I

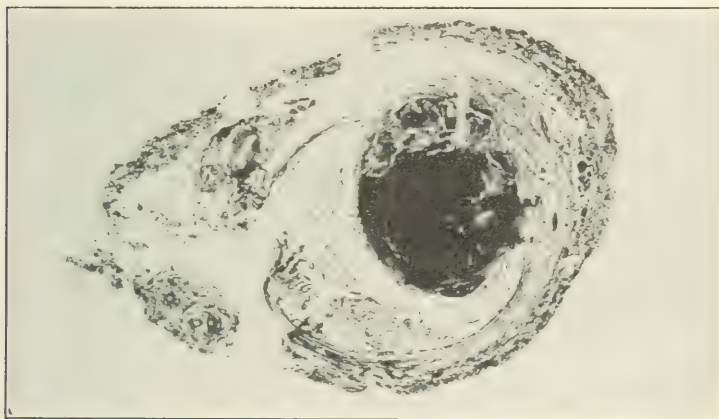


FIG. 1.—Represents the half nearer the fimbriated end = *one lumen*.

had previously given, I made a vaginal incision first to make sure of the diagnosis. The blood flowed out so rapidly from the incision into the peritoneum that I could not have finished the operation per vaginam had I been so minded which I was not. A pulse of 80 with plenty of fresh blood and plenty of active bleeding going on in the abdomen is by no means rare.

An operation is often performed on the principle that, whether the patient be suffering from an ectopic gestation or an inflamed or diseased tube and ovary, operation is at any rate justifiable. This may be perfectly justifiable when bimanual examination shows something tangible, yet in many cases only the history and not constitutional signs point in the direction of ectopic gestation and the history so often creates the thought of incomplete abortion. In principle and from a scientific standpoint this is wrong, especially when we have at our command a method

so simple as colpoceliotomy, a method which assures us of a definite diagnosis, a method which in many instances allows us to readily and safely complete the operation at the same time. An abdominal laparotomy is often refused as the hospital patient, especially, expects only a cureting for incomplete abortion and will not consent to operation unless or until the condition becomes very severe and the indications demand it urgently.

In doubtful cases error may be avoided and days and weeks of observation may be spared and a sure, definite diagnosis of the condition of the tubes and of the uterus may be obtained by the simple procedure of a posterior or anterior colpoceliotomy,

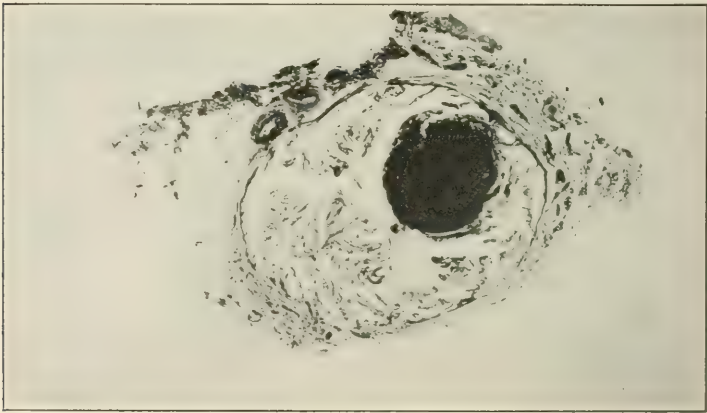


FIG. 2.—Shows the almost extreme outer end of the ovum in relation to two tubal tufts.

preferably the latter. The uterus is first examined with the sound, it may be cureted; the amount and character of the scrapings may be noted; examination of the adnexa may be made under the most favorable opportunity by delicate bimanual touch, and then the peritoneum is exposed or the peritoneal cavity is entered, preferably by the anterior vaginal route, and in this way the uterus, tubes and ovaries may be brought into view.

In multiparæ it takes at most three to five minutes to reach and enter the peritoneal cavity per vaginam, and in a large number of instances, if one is doing the operation simply for diagnosis and wishes to complete it abdominally, the procedure takes even less time, for it is not always necessary to open the peritoneum if ectopic gestation be present. In the vast majority

of instances, I believe, save in a few extremely early cases, as soon as the bladder is separated and the vesicouterine fold of the peritoneum is exposed one gets the dark blue shimmer of blood, the same discoloration that one finds in an abdominal operation when there is a large amount of fresh or collected blood in the peritoneal cavity.

There are two methods of incision for purposes of diagnosis; one is the transverse, with a blunt dissection of the bladder from the anterior wall of the cervix, after which a narrow retractor is introduced underneath the bladder and the vesicouterine fold of peritoneum comes into view. This method is quite sufficient

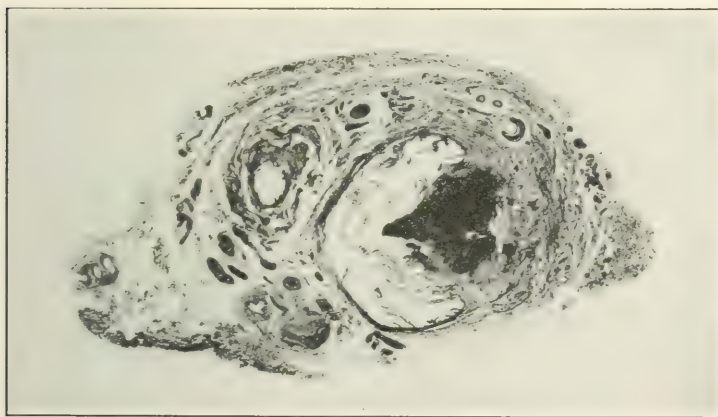


FIG. 3 —Represents the half nearer the uterine end=*two lumena* separated by a complete muscular septum.

in women who have had one or more children for in such cases the uterus is fairly large and the cervix wide, the mucosa is thick and quite an extensive area of the vesicouterine fold of peritoneum can be brought into view. In women who have had no children, the cervix, with few exceptions, is narrow, the vaginal mucosa is thin, the separation of the bladder from the anterior wall of the cervix and uterus is not so easy, and the retractor introduced underneath the bladder exposes the vesicouterine fold of peritoneum less distinctly and to a lesser extent than in the multipara. In these cases, and of course also in some of the multiparous cases, a longitudinal incision is added to the transverse; the bladder separated from the anterior wall of the vagina as well as from the anterior wall of the cervix and uterus, and in



this fashion in practically every case the vesicouterine fold of peritoneum is readily exposed.

The value of these anterior incisions lies in the fact that we are enabled, when desired, to open the peritoneum, to enter the peritoneal cavity, to make a digital intraperitoneal examination, to bring the uterus and adnexa into the vagina and to perform the operation at the same time if all conditions are favorable. By favorable conditions we mean the absence of rapid fresh bleeding. When only dark thick clotted blood or clots are present, there is little difficulty in bringing the uterus into the vagina and exposing the tube by digital touch. The size of the tube is ascertained, and adhesions of the tube to the hem-

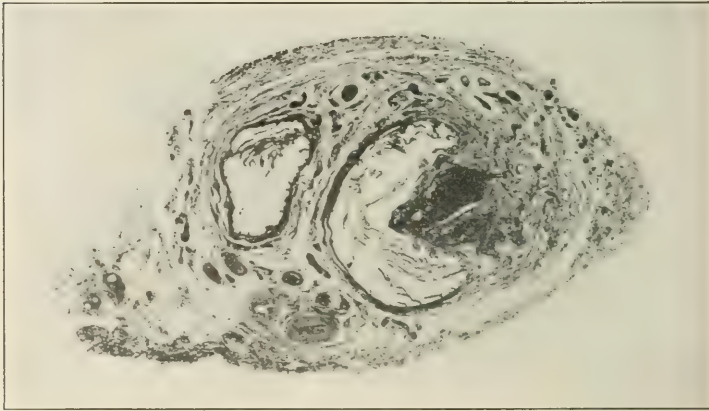


FIG. 4.—Shows the smaller lumen increasing in diameter while the one containing the ovum is becoming smaller.

atocele or to surrounding structures are readily loosened, and in this manner the tube is readily brought into view. If the size of the tube is great, if the tube is quite long, if the mesosalpinx is very friable, if the lig. infundibulo-pelvicum is short, attempts at vaginal removal must not be carried further. At any rate the whole procedure up to the point of determining whether the vaginal operation is feasible, takes at the most five to eight minutes. As stated before, if the anterior or vesicouterine culdesac is simply exposed or if a slight opening is made in it for diagnostic purposes, the whole procedure takes less than from three to five minutes.

In twenty cases of ectopic gestation since the first of last October, I made use of this procedure seven times, using the

anterior route six times and the posterior route once. The operation was completed vaginally four times.

Five times I have made the anterior incision and found no ectopic gestation, the conditions then being tuboovarian, the ovarian element probably producing the alteration in menstruation, or incomplete abortion.

The first case had been operated upon by me seven months previously for a typical ectopic gestation, the right adnexa having been removed. The left side showed a chronic salpingitis and was just the kind of a tube that would lend itself readily as a nest for an ectopic gestation. The patient and her husband were warned that conception should be avoided, for two years but seven months after the first operation the patient missed a

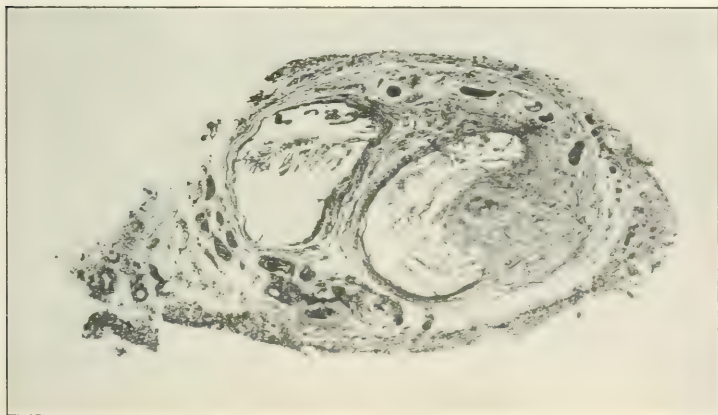


FIG. 5.—The ovum is now represented by a clump of decidua and trophoblast cells embedded in the hypertrophied ridge of the musculature.

menstrual period and began to stain and have attacks of cramp-like pain in the left side. A diagnosis of ectopic gestation was made and an anterior vaginal celiotomy was performed. As soon as the vesicouterine fold of peritoneum was reached, a distinct bluish discoloration was noted, showing that free blood or clots were present in the peritoneal cavity. The peritoneal fold was incised, the uterus drawn into the vagina, and an ectopic gestation was found in the left tube which was readily delivered into the vagina and removed without difficulty. The patient made a smooth convalescence. Two cases had both been diagnosed, before coming under my observation, as incomplete abortions. Owing to a retroflexed uterus held in that position by a gravid

adherent tube in one case and to the fact that only an indefinite mass could be made out in the other case, and that while ectopic gestation was suspected, a differential diagnosis could not positively be made, a vaginal celiotomy was done in both these cases.

The fourth case had a menstrual period fifteen weeks after her last labor; she then spotted occasionally until three weeks before operation when she had a normal period lasting seven days. She went clean for two days and then began to spot again; had abdominal cramps eight days ago lasting a day; more cramps four days ago and again two days ago. There was considerable



FIG. 6.—The two lumena now begin to communicate. The septum is channelled across at one wall.

distention of the abdomen. This tube at the location of the ovum was of a diameter scarcely larger than that of a large bean.

Another case gave a rather typical history but her physician absolutely refused to countenance the possibility of an ectopic gestation, and, as stated elsewhere in this paper, I made a vaginal incision to prove to him that the diagnosis was correct. In all these cases as soon as the vesicouterine fold was reached by the T-shaped incision a deep bluish discoloration was observed the same as one sees before opening the abdominal peritoneum, with free blood in the peritoneal cavity.

The sixth case was begun vaginally, tube was delivered and could easily have been removed but a sponge holder was accidentally opened and a small sponge was left in the culdesac. I was unable to reach it and therefore closed the vaginal incision and



removed the ectopic gestation as well as the sponge through the abdominal route.

In one case the hematocele was so firm and hard, situated in the culdesac of Douglas, that this fact plus the temperature made her physician diagnose posterior parametritis. An incision into the large mass made with sharp-pointed scissors showed that we were dealing with an hematocele. I have never advised the removal of an ectopic gestation through the posterior vaginal incision, especially with a large hematocele. This case was completed abdominally.

Let us turn our attention for a few moments to the question of ectopic gestation and its etiology. For the production of an



FIG. 7.—Shows a section of the tube just outside the ovular attachment and nearer the uterus with only one lumen.

ectopic gestation it is necessary that some obstacle either on the part of the ovum or in the path through which it travels prevents its complete passage through the entire tube, and results in its location at some intermediate area where its subsequent development realizes the condition known as ectopic gestation. In the case which I report to-day the obstacle was a congenital spur associated with a blind accessory lumen.

By some it is claimed that the ovum, through external migration or some other delay after impregnation, becomes too large to pass readily through the tube.

This explanation might possibly hold good in a certain number of cases, but it does not ring true, nor does it seem probable. It does seem reasonable, however, that because of some congenital

or acquired abnormality within the tubal lumen, especially at its more narrow confines, an obstacle to the further passage of the ovum is presented, and that this obstacle, whether it be a congenital stricture or a twisting of the tube, or a narrowing of the canal due to edema for inflammation, or to union of the tips of the tubal mucosa, or to interference with the activity of the ciliated epithelium, is sufficient to produce what is known as ectopic or tubal gestation. In a large proportion of cases of tubal gestation the other tube is found to be affected or involved by inflammatory changes, and so frequent is this finding that it seems as if we must accept inflammatory changes as the most frequent cause of obstacles to the untrammelled progress of the ovum. Therefore, when a pregnancy does occur in a tube, it occurs there before the outer end is inflamed and the lumen narrowed; or else pregnancy occurs at a later period in a tube whose outer and inner areas were involved, but the outer end, having healed and become normal, takes up the ovum while the inner area, still retaining a narrowed lumen, furnishes the obstacle to further passage.

In this way we may understand the occurrence of an ectopic gestation very shortly after marriage, or long after a previous pregnancy. I have always viewed this explanation of an ectopic gestation as furnishing the keynote in the way of understanding those cases of primary and secondary sterility which, in spite of the existence of active spermatozoa, and in spite of every medical and surgical treatment of the cervical or uterine causes of sterility, have still remained sterile. In such cases the tubes are closed at the outer end or else not enough of the outer end is normal to draw the ovum into the tubal lumen even to the degree necessary to the production of ectopic gestation. If one of the tubes heals completely then a uterine pregnancy takes place.

Every case carried in mind by the physicians or recorded in the literature where a patient, not purposely sterile for years after the removal of the diagnosed cervical and uterine causes of sterility, subsequently becomes pregnant either in the tube or in the uterus, is possibly a proof of the existence of tubal involvement as the cause of that preceding period of sterility.

*Earliest Recorded Tubal Ovum.*—A patient was admitted to my service in the Beth Israel Hospital who had been married only ten weeks. She went only a very few days over her period and then began to bleed and spot for some days, accompanied by cramp-like pains of great severity in the right side. The

patient was recently married and the only possibility other than ectopic gestation was a beginning tubal inflammation. The patient was very obese and the vagina rather small. It was impossible at first to feel anything whatsoever abnormal. Careful examination, however, excluded any recent infection; there was nothing in the urethra, nothing in the ducts, nothing in the secretion from the uterus that could call attention to the existence of a Neisserian infection. Had the patient been married many months, even years, with the same train of symptoms, the fact that no external evidences of an infection could be found would not have weighed so heavily in favor of an ectopic gestation, for the reason that the evidences of such an infection might have disappeared long ago, and a possible recrudescence of the annoyance or growth, or the development of the fluid in a tubo-ovarian tumor might be responsible for the pain. So certain was I of the diagnosis that I determined to perform an abdominal operation and found only later that I was really dealing with a tubal gestation, probably one of the smallest tubes and one of the earliest cases that have yet been reported in the literature. The bleeding had lasted three days, associated with severe cramp-like pains chiefly on the right side of the abdomen, when she applied to the hospital.

The curetings had grossly failed to show masses that would suggest an early incomplete abortion before I proceeded with the laparotomy. No blood, free or clotted, was present in the abdomen. The right adnexa were enlarged—the tube looked somewhat purple, the ovary was enlarged about three times and contained a hemorrhagic mass about the size of a walnut. A few drops of blood could be expressed from the ampulla of the tube. This part of the tube was distended but no nodule could be felt. Indeed there was so little change in the tube and comparatively so much more hemorrhage into the ovary that the latter seemed the more likely seat of the trouble and the suggestion of ovarian pregnancy was presented. *The isthmic portion of the tube, the portion which later proved so interesting, was so unchanged that a resection of the tube and ovary was done external to it.* In view of the suspected ovarian pregnancy it was deemed essential for the complete study to resect also, the remaining portion of the tube which was done. It became clear at the operation that the diagnosis of ectopic gestation was based partly upon the palpation of the enlarged ovary and its hemorrhagic corpus luteum and that the tube was absolutely not palpable.



The subsequent examination of the specimen showed likewise how impossible it would have been to palpate the ectopic ovum.

The following description is to be credited to Dr. Eli Moschovitz and Dr. I. C. Rubino, respectively, pathologist and adjunct gynecologist to the B. I. Hospital.

*Macroscopically.*—The isthmic end of the tube is thinner than a lead pencil and presents nothing abnormal. On palpation of the tube there is a sensation of a rather firm nodule of the size of a small pea at about the center, over which the tube wall seems to roll. Section was made through its center. This showed a firmly organized coagulum on one side of which was a semilunar cleft which was assumed to be tubal lumen. The coagulum was attached firmly to the wall on the side opposite the mesosalpinx. Each side of the coagulum, including small portions of the tube, was blocked and cut serially. Unfortunately, a small number of sections were thus lost in the median part of the specimen, but as further study showed, these were unimportant. The sections were uniformly stained by the hematoxylin-eosin method.

*Situation.*—The ovum is circular in outline and is attached to the superior wall of the Fallopian tube opposite the attachment of the mesosalpinx. It occupies about one-half of the tube lumen and is attached to about one-third of the circumference of the tube. The tube is apparently not enlarged and would correspond in size to an average tube at this point.

The embryo as such cannot be distinguished. It is represented in this specimen by trophoderm. This consists of two chief parts, a superior and inferior, which extend along the entire ovular attachment but occupy only about one-fifth of the circumference of the coagulum.

Decidua as such is not seen.

*Size.*—By actual measurement the tube is  $5.5 \times 6$  millimetres. The entire ovum measures at its greatest diameter  $3.75 \times 3.5 \times 2$  millimetres. The uterine half of the tube containing the ovum measures 5.5 millimetres in its vertical axis by 5 millimetres in its transverse axis.

The average normal tube corresponding to the point of nidation of the ovum in my own specimen, according to Poirier, Charpey, and Ballantyne, measures 5–6 millimetres.

There is no leucocytic infiltration in the stroma or in the muscular layers or the serosa.

Followed toward the uterine end a small structure appears in

the mesosalpinx, lined by what seems to be tubal epithelium (Fig. 4). It is completely separated by a muscular septum from the large tube enclosing the ovum and resembles, on account of its primitive epithelial lining, the isthmic portion of the tube at a point very close to the uterine insertion. These two lumina are separated by a muscular layer 1.1 millimetres.

*Summary.*—The specimen shows an exceedingly small ovum not sufficiently large to fill the normally narrow lumen of the isthmic portion of the tube. The tube at this point shows some anomalous features.

1. A muscular spur formation is present, causing a diverticulum to form with its blind end buried in the mesosalpinx, and on the mesial aspect of the point of nidation.

The ovum rests upon and is imbedded in a muscular eminence to the distal side of the muscular spur and is nowhere in connection with the diverticulum on the proximal side. It projects into the lumen of the tube but is covered by tubal epithelium. This covering is complete in the half nearest the uterus and only partially in the half nearest the fimbria where it may be assumed to suggest a beginning intracapsular rupture.

The embryo as such is not present. It is represented by several large masses and streaks of trophoderm which lie near the trophoblast. There is as yet no true chorion formation.

Leucocytes are present only underneath the base of the ovum between the loose muscle fibers, and nowhere else in the serosa, musculature or mucosa of the tube. In view of the total absence of evidence of salpingitis this leucocytic infiltration can be assumed to indicate a secondary local reaction and not a primary inflammation.

134 WEST EIGHTY-SEVENTH STREET.

## PREGNANCY, SIMULATING EXTRA UTERINE FETATION OR PUS-TUBE.<sup>1</sup>

BY

J. H. CARSTENS, M. D.,

Detroit, Mich.

THIS case is reported to show how easily mistakes are made in diagnosis, even where the greatest care is taken and where there has been large experience.

Miss H. K., age twenty-three, had always been well; never had any serious illness or any pelvic trouble. Her menstruation was

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists, held at Toledo, Ohio, September 17-19, 1912.

normal until the end of December, 1911. At the end of January she began to menstruate, but stopped in a day. At the end of February she had pain, a discharge, and painful urination. This was followed by pelvic inflammation, with severe pain on the right side, and temperature of 101.5° F. She was confined in bed for ten days or more at this time.

By the middle of March she recovered sufficiently to be up and about, but still complained of pain on the right side. The discharge had lessened. She did not menstruate, however, and was finally brought to me.

I saw her first on April the sixth and got the above history. On thorough investigation I found a vaginal discharge, which on microscopic investigation proved not to be a gonococcus infection, as I had suspected. She had no elevation of temperature. On vaginal examination the cervix was found a little larger than the normal size, but hard like that of a virgin. The uterus lay forward and toward the right, but apparently united to a mass on the right side, which could not be mapped out well, on account of the great tenderness and the fear that I might rupture an ectopic pregnancy, which I suspected.

The breasts were somewhat enlarged and darkened around the areolæ. I made up my mind that the girl was suffering from an extrauterine pregnancy, although as a result of the fever and the inflammation there might be a quiescent pus-tube or a rupture of the extrauterine fetation might have caused the inflammation and adhesions. On account of the comparative hardness of the cervix, it could not be a normal pregnancy. I therefore made a tentative diagnosis of tubal pregnancy, a partial rupture had caused inflammation and adhesions. I believed that under these circumstances an operation was indicated.

She went to Harper Hospital the next day, and I operated on April eighth. While operating I called the attention of a number of physicians (and assistants) who were present, to the difficulty we formerly had in diagnosing this condition and to the dread which even the general practitioner had when the peritoneum was opened. I also related the history of the case reported by Dr. Joseph Price, which was diagnosed as a tubal pregnancy. Dr. Price told the husband, a physician, that he would cut down through the tissues to the peritoneum, and that if the diagnosis was correct, he could see the coagulated blood through the thin serous membrane; that it was quite black beneath.

When I cut down to the peritoneum I found it very dark, but not as black as we usually see in acute cases of freshly ruptured tubes.

I attributed this lack of blackness to absorption, as the rupture must have occurred about four or five weeks before. What was my astonishment on carefully opening the peritoneum to find a pregnant uterus, adherent to the right side of the pelvis, high up, as were also the right ovary and normal tube. The appendix was above and not connected with the mass.



The pregnancy must have been nine or ten weeks along. The adhesions were readily broken up and the raw surfaces dusted with aristol. The left tube and ovary were perfectly normal. The abdominal incision was closed in layers in the usual manner. The patient made an uneventful recovery.

This case shows how difficult it is to make a correct diagnosis in abdominal troubles and how easily we can err.

#### DISCUSSION ON THE PAPERS OF DRs. BANDLER AND CARSTENS.

DR. SYLVESTER J. GOODMAN, Columbus.—I wish to report a case which is almost like the one reported by Dr. Carstens. The patient is thirty-two years old, very frail in appearance, has two children, the younger being six years of age. Both labors were severe and were forceps deliveries. The patient, who was referred to me by the attending physician, complained of severe pain in the right tubal region. She was almost regular until February 4, when she missed a period, and was perfectly dry until April, when she menstruated again. On the twenty-seventh of April she ceased to menstruate, complained of pain in the right side, gas in the stomach, nausea, temperature and pulse normal. There is possibly a gonorrheal history in the husband. Vaginal examination shows a tender mass in tubal region. The uterus appears to be three months pregnant. She is tender in the region of the right tube. The perineum and cervix are lacerated. There is a mass to the right of the uterus about the size of an orange and apparently disconnected except at one point. The diagnosis lay between appendicitis and ectopic pregnancy. I made a median incision, went down to the peritoneum, and got a blue color, and on opening the peritoneum found something like this (indicating). Diagrammatically we will suppose that it came off here (indicating) and right up at this point at the head of the colon was an inflamed and thickened appendix. You can see the shape of the uterus. Her pain was due to a badly involved appendix. The uterus is returning to normal shape and the woman is doing nicely.

DR. GORDON K. DICKINSON, Jersey City.—There are two points in connection with diagnosis and treatment that I desire to mention. I am glad to see that Dr. Bandler made an error of omission and Dr. Carstens one of commission. I also made an error. I had a case in the hospital which I diagnosed to be "Nothing doing." A friend in New York did the operation and got the credit. I do not know of any one symptom which is pathognomonic. Reference has been made to the blue peritoneum and the presence of blood. In doing a colpotomy for cystocele, procidentia, etc., on a case which presented no symptoms of tubal distention, I brought down the uterus, as I always do, and found there was a small enlargement, ectopic. There was no blood in the peritoneal cavity, and no evidence of its

being ectopic pregnancy. But on removal and incising it, I found the smallest fetus I have ever run across. I referred it to Dr. Walsh, of the New York Lying-in Hospital. There is nothing harder to diagnose than these cases of pregnancy and appendicitis. These two diseases bother me very much, and pregnancy in a tube is harder still. The treatment should preferably be vaginal section. I do not think any man has any more right to explore a woman's abdomen, make a scar and disfigure her than he has to do any other unnecessary operation. If you can operate by the vagina, and you generally can, you should always do so. The route is easy. By the T-shaped incision one may open up the peritoneal cavity, bring down the fundus, and there you have the tube unless there are adhesions. You can treat it, remove the clot, thoroughly inspect the other tube, and leave the patient in a condition so she can leave her bed more promptly. She will have less shock and quite a prompt recovery.

DR. K. ISADORE SANES, Pittsburg.—We would like to ask the doctor why he prefers the exploratory anterior incision. Within the last six months, we have removed two tubal pregnancies through the posterior culdesac. We choose the posterior incision because with it we do not need to disturb the bladder, and besides, if we find any necessity for drainage, we can drain through the same incisions. Again if we have a case of ruptured tubal pregnancy that has been bleeding for some time, we cannot tell whether we have to deal with an infection or not. By operating through the posterior culdesac, we can easily drain when we are in doubt.

DR. CHANNING W. BARRETT, Chicago.—With reference to the question of colpotomy in the diagnosis of extrauterine pregnancy, I recognize the difficulty we may have in making a diagnosis where there is hematoma present or any considerable enlargement of the tube, but we should be very cautious in making a colpotomy for diagnosis. There are cases on record where women have died suddenly from an opening through the vagina for diagnosis. If that method becomes necessary for diagnosis, the patient should always be in a hospital and ready for an abdominal operation if it is required after that operation. We should be very careful in teaching men, as a rule, about the diagnosis of extrauterine pregnancy, in order to tell them what they shall do with the patient. Once in a while we may fall back on exploration to know whether we are dealing with extrauterine pregnancy or not.

As regards operating for extrauterine pregnancy and finding normal pregnancy, I will briefly relate a case that I saw for the first time out of the city, and made a diagnosis of extrauterine pregnancy, continuing about three and one-half or four months. The uterus seemed to be felt running up from the vagina a distance of  $3\frac{1}{2}$  inches. In other words, one could feel a normal enlargement of the uterus. Having made this diagnosis,

I operated and found that we had a normal pregnancy and a very long cervix that could be felt bimanually through the abdomen, that is, one hand posterior, and the other hand anterior to the uterus. The condition which made the case unusual was the presence of twins in the uterus. This was the third pair of twins that woman had had.

DR. BANDLER (closing).—I do not advocate the vaginal route as the usual route for removing ectopic gestation by any means. I use it principally for diagnosis. If I were certain of the diagnosis, I would open the abdomen. It is only when I am not certain, and I do not wish to tell the doctor or patient that I am pretty sure, that I find this method of value. If I am pretty sure, I say so and I open the abdomen. If I am a little less than sure, then I prefer to go in through the vagina and find out. The reason I adopt the anterior instead of the posterior vaginal incision is that there is apt to be a lot of bleeding in the latter route, whether from the edge of the wound or from the peritoneal cavity. In the next place, if you operate and wish to take out the tube that contains an ectopic pregnancy, you cannot do it as well through a posterior incision as you can through an anterior, because you cannot get the organs down into view as well as through an anterior incision. Where the uterus is anteflexed or anteverted, you can then especially get at it more easily by the anterior incision. You can see the uterus. If there is an ectopic gestation, with a mass in the posterior culdesac, then I make a posterior incision for diagnosis but do not attempt any further operation through the vagina posteriorly. Frankly speaking, I cannot do it nearly as well by the posterior route as the other way, and I don't think any one else can.

I want to make an explanation about this case of early ectopic gestation. The patient was married only ten weeks. She came into the hospital with a history that for three days she had had terrific cramps on one side. The history was typical. We found a small mass on one side. It occurred shortly after marriage without any evidence of Neisserian infection of the ducts or urethritis, or cervical discharge. In the absence of these things the history was typical. I opened the abdomen, and apparently instead of finding a tubal gestation, I found a corpus luteum about three times the normal size. I removed the ovary, thinking it might possibly be an ovarian gestation, having had one such case a few months before. I resected a portion of the tube. In the resected apparently normal tube was found this earliest recorded ovum. Had that operation been done vaginally by means of a posterior incision it would have told us nothing. An anterior incision might have been of use. It is marvelous how such an early case gave typical colicky symptoms due to spasm of the musculature of the tube.

DR. CARSTENS (closing).—There is little or nothing to add to what I have already stated in my paper. We all make mistakes. A few years ago I was called to see a case of what I



thought was typical appendicitis. This woman I knew. I operated on her two years ago, removed a cirrhotic left ovary and tube. She had elevation of temperature, which gradually increased for two days. It rose to 102, and her pulse was 84. She had a severe pain right at McBurney's point, and it was certainly a typical case of appendicitis I thought. I operated for appendicitis, and when I got to the peritoneum it was black, and I said we must have made a mistake. When I opened the peritoneal cavity blood gushed out. There was nothing the matter with the appendix, but the woman had a tubal pregnancy. I enlarged the incision and got out the right tube. In appendicitis we have elevation of temperature with a slow pulse, 80 to 90, until the case has further advanced, then we get a high pulse. With extrauterine pregnancy, we have a normal temperature instead of an elevated temperature, with a rapidly increasing pulse to 110 or 130. I will simply say on general principles that I have operated on two or three cases of extrauterine pregnancy through the vagina, but all things considered, I do not believe we can do that kind of work. I have seen some cases operated on through the abdomen where I know the extrauterine pregnancy could not be gotten out through the vagina. The least attack may endanger the patient's life. With a clean cut through the abdomen you can remove the pregnancy, you can see what you are doing and you are not likely to do the patient half as much injury in groping around in the dark through the posterior or anterior culdesac, where you do not know what you do. So far as leaving scars is concerned, you can by sewing them up with large bayonet needles. But by bringing the skin together, with a little plaster, you will not have any ugly-looking scars.

### NOTES ON INJURIES OF THE PELVIC FLOOR RESULTING FROM CHILD BIRTH.<sup>1</sup>

BY

FREDERICK BLUME, M. D.,

Pittsburg, Pa.

PATIENTS with injuries of the pelvic floor due to labor, who have come under my observation during the past few years, have convinced me that very little progress during the past thirty years has been made in the management of these lesions immediately after labor in the hands of the general practitioner. As in many other branches of medicine, much has been accomplished in the development of the art and science of obstetrics during this period. Since the introduction of bichloride of mercury into obstetrics thirty years ago, many debatable points

<sup>1</sup> Read before the Twenty-fifth Annual Meeting of the American Association of Obstetricians and Gynecologists at Toledo, Ohio, September 17-19, 1912.

have been settled, new operative procedures have been devised, old ones improved, every effort has been made to protect child-bearing women, to render the trying days of the lying-in period as comfortable and safe as possible, and to prevent invalidism following childbirth. But the favorable results of the teachings of modern obstetrics, so evident in our maternity hospitals and in the obstetrical departments of general hospitals, are not so apparent in the obstetrical work of the general practitioner.

Various causes seem to contribute to render the practice of obstetrics more or less undesirable to the successful physician. It is well known that the average practitioner is very poorly paid for his obstetrical services, and this, in my opinion, is one of the causes which induce him to spend as little time as possible with the parturient woman and to give nature a chance to do, what he thinks, it can do, or ought to do. The view that child-bearing is a physiologic process, that therefore the vast majority of deliveries are instances of normal labor and rarely need the assistance of an accoucheur, is still held by many physicians. Believing that nature is able to restore these organs to normal or almost normal conditions under favorable circumstances, they do not consider lacerations of the pelvic floor an important or unfortunate injury and do not deem it necessary to repair them immediately after labor. Thus it happens, even at the present time, to be a rather common occurrence to hear a patient say that her physician assured her she had been fortunate to escape a laceration, or that she had but a very superficial tear which does not amount to much, while the examination shows the skin perineum to be almost intact but a tear in one or both vaginal sulci. Two years ago I operated upon a patient with a complete laceration, extending into the rectum, after she had been kept in bed by her physician three weeks with her legs tied together in order "to give nature a chance," as he expressed it. Experience of this kind, and I could quote a number of similar instances, warrants the assertion that this very important subject needs and should be given our earnest consideration.

Within the past few years I have noted that a change has taken place in the remarks of this class of patients. Some of them, when giving the history of their ailments, are quite severe in the criticism of their physicians because they "were torn so badly," that they had to be sewed, six or seven sutures being required. My explanation to such patients that perineal

lacerations are unavoidable and that the repair in her case proved her physician to be a careful and conscientious obstetrician, was almost always met with the assurance that some of her friends, recently delivered by other medical attendants, needed only one or two sutures. This new method of estimating the efficiency of the obstetrician according to the number of sutures which he uses in the repair of the perineum is at first sight rather amusing. On closer consideration, however, we find that something has been gained, something of importance to the child-bearing woman as well as to the obstetrician. The knowledge that some sutures are required to repair injuries of the pelvic floor, that the number of sutures varies with different patients and with different physicians, has set women to thinking. Discussing this subject with friends they find how little they know about those organs and the functions of those organs which are of such importance to them the greater part of their lives. The desire to obtain further information is aroused and, with increased knowledge, they very soon will modify the opinion about their medical attendant and be less offensive, less unjust in their criticism.

The various methods recommended for the protection of the perineum during the passage of the head through the vulvar orifice are well known and do not need further discussion here. While some authors are enthusiastic in their advocacy, others ascribe their success to the expansibility and elasticity of the soft structures. This difference of opinion as to the value of such methods is well founded. It certainly is assuming a great deal to expect that the vaginal outlet, which in the married nullipara barely admits the introduction of two fingers, should at the delivery of the child dilate to such an extent as to permit the passage of the head without some laceration. The assertion, therefore, is justifiable, that lacerations of the pelvic floor are unavoidable under certain circumstances in a large percentage of the cases in spite of all prophylactic measures. While this is well known by the medical profession the public looks at it in a different way. Women, even those of the higher walks of life, do not believe that a laceration of these parts is unavoidable in a large percentage of the cases. They blame the obstetrician and insist that the injury is due to his ignorance and carelessness. On the other hand, the physicians are well aware of this prejudice and therefore hesitate to admit the laceration, or try to minimize it by telling the patient that



only one or two sutures are required. This, I think, is the cause why we gynecologists, even at the present time, see so many women with perineal and vaginal tears, which should have been repaired immediately after labor and why this class of patients still furnishes a large percentage of our operative cases. The diagnosis of this condition being so easy and the serious consequences so well understood, there is no reason why the obstetrician should hesitate to admit the tear other than the fear of being blamed for something unavoidable under certain circumstances, which the woman however, considers an accident, and avoidable by ordinary care.

It is worthy of note that in this era of preventive medicine the child-bearing woman seems to have been overlooked by the general practitioner. The repair of the injuries of child-birth immediately or shortly after labor, as done in the daily routine work in maternity hospitals, is the only efficient method of preventing serious disability so often following labor. Nature's method of repairing lacerations, even superficial ones involving the fourchet, is accomplished by granulation and therefore not successful. Primary union can be obtained only by the operation, the value of which as a prophylactic measure is not and cannot be disputed. This view seems to be almost universally accepted and, on careful observation, it must be admitted that some progress has been made in the management of these lesions by the general practitioner, but this progress has been very slow. Thus the question presents itself,—how can we improve this unsatisfactory condition?

In a paper which I read before the Allegheny County Medical Society in 1904, discussing the early symptoms of cancer of the uterus, with remarks on our shortcomings in the management of this disease, I recommended the education of the laity upon sexual matters as the only means of reducing the mortality of this dreaded disease. I said among other things. "It is a lamentable fact and characteristic of our defective methods of education that even intelligent, educated women have no knowledge to speak of about those organs which are of such vital importance to them during the greater part of their lives. That women need education along this line cannot be disputed and no valid reason can be given why they should not receive it."

What I said at that time with reference to uterine cancer applies with the same force to the lesions resulting from child-birth. In connection with other things women must be taught

that these injuries are the rule and not the exception, that only a small percentage of the patients escape such injuries and that such escape is possible only under the most favorable conditions. They must be instructed that neglect of these injuries results in suffering and invalidism, that their immediate repair is the only measure which prevents serious consequences, and that such repair must therefore be regarded as a part of the delivery, its final step.

Such information will be of great benefit to child-bearing women, who, in order to protect themselves, will demand the repair of these lesions as a preventive measure. At the same time it will improve the position of the obstetrician, who, no longer fearing unfair criticism, will resort to the only proper method of treatment—the operation immediately after delivery in ordinary cases. If the tear extends into the bowel or through the sphincter the operation may be done on the day following labor, with better light and assistance.

There is a large number of women who either from habit or from economy, choose to be delivered by midwives. I refer especially to those women who come from southern Europe, whose deliveries are tedious and complicated in a rather large percentage of the cases, due to abnormalities of their pelves which, compared with the pelves of women of the Anglo-Saxon race, are smaller and often not so well formed. It is this class of patients which offers an excellent opportunity to study the serious consequences resulting from neglected injuries of the pelvic floor. Relief of this unfortunate condition cannot be reasonably expected until these poor child-bearing women are given the advantages of modern obstetrics. How to accomplish this is one of the most important problems confronting the profession at the present time, and one which in my opinion, can be solved only by legislation.

JENKIN'S BUILDING.

DISCUSSIONS ON THE PAPERS OF DRs. STILLWAGEN\* AND BLUME.

DR. EMERY MARVEL, Atlantic City.—I doubt if there is any subject on our program that is more important than the one now under consideration. There is probably no other one condition that causes so much trouble to women as do the lacerations incident to childbirth. If these lacerations are repaired early,

\* Paper by Dr. Stillwagen will appear in a later issue.

much suffering will be prevented. The remedy for their relief is indicated, simple and can be easily applied. One reason why the remedy is not applied may be largely due to ignorance on the part of some members of the profession who take care of these women and fail to recognize the trouble and see that the correction is made; or it is due to ignorance on the part of the women themselves in not knowing their trouble. I wish to endorse very heartily the recommendations for better education of the laity, who need it so much in order that these women may be relieved of their sufferings and inconvenience by soliciting timely measures for treatment.

DR. J. HENRY CARSTENS, Detroit.—The preceding speaker has stated facts with which I agree, but there are certain things back of them, and one is the lack of education in obstetrics. It is not that the teacher does not teach obstetrics correctly, but he has not the facilities to do so as they have in Europe. The greatest trouble in a medical college is to get obstetrical material enough for the student. Thirty years ago students left medical colleges without ever having seen a case of obstetrics. Later they required that students should at least see two cases of obstetrics, and now they require that they attend four or five cases. If you teach obstetrics as it ought to be taught, a great many lacerations of the cervix and perineum might be prevented. To deliver a woman on the bed, the delivery can be brought about better if you put her on the side with her limbs drawn up. They put on forceps, pull, and then take the forceps off. I have shown students how to put these women on the side, how to apply forceps to bring the head down, bring it down on the perineum, and tell them if they will just take time, the perineum will gradually relax. You must massage it, work on it gradually and the head will be delivered without producing any laceration. If you have an extraordinary case where the perineum is rigid or edematous and is bound to tear, you can perform episiotomy, cut it on one or both sides, and prevent a tear in some cases. One very important thing is to teach students that they must take more time in the very last few minutes of labor; that if they would wait five minutes more, these muscles would relax. A lacerated perineum ought to be sewed up right away. In good institutions I do not think there are lacerations of the perineum in more than 10 or 15 per cent. of the cases, but there are a certain number of perineal tears that will tear. In blondes the perineum will tear more easily than in brunettes. There is no question about that at all.

DR. WM. H. HUMISTON, Cleveland.—This paper is timely and full of interest, and I agree with the author that with the care a competent man can give these cases he will have more or less tears. The only hope for the woman is that the man attending her is a competent obstetrician and knows how to put in his sutures to obtain a good result. If tear is not repaired at once, her chance of getting a proper pelvic floor and muscular



perineum by the ordinary operating surgeon is almost nil. These secondary operations are easily done if you will expose the muscles, unite them together, and close the incision with continuous catgut. The old method of denuding down to the fascia and uniting its surfaces together does not afford relief. I frequently reoperate on patients who had been operated upon before without relief. These patients have no muscular perineum and pelvic floor, and the operation has been a failure.

DR. EDWARD J. ILL, Newark.—I not only agree with what Dr. Blume and others have said, but I would encourage him to continue in this line of work. I should like to go a little further and say that there is a form of injury to the pelvic floor that is not recognizable by any lesion of the mucous membrane or skin, and where there is no apparent laceration of the tissues. In those cases the levator ani cannot be felt. I would advise that the examination be continued the next day or in twenty-four hours, and if still muscular tissue cannot be felt, that then the vagina on both sides be split along the sulcus, and the muscle and fascia brought together and sewed over. I deprecate very much that operation should be done immediately after labor. I think all failures have been due to the fact that the operators have relied on two or three sutures to do the work after labor. Twenty-four hours should always intervene between labor and operation for the repair of any laceration. The patient can be shaved and everything cleaned up, and the necrotic tissue can be cut away with a pair of scissors and the tissues properly brought together. All the swelling incident to labor will have been reduced and the sutures will fit snugly and closely without danger of cutting into the tissue.

DR. GORDON K. DICKINSON, Jersey City.—There are three points I wish to refer to. In the first place, we forget the baby. The statistics of those who study these cases the most go to show that when a child is slowly born it is liable to petechial hemorrhages into the brain, and is not as bright as it should be. In the second place, rapid delivery is very apt to cause a laceration of the tissues, even though it may only be detrimental to the mother temporarily. I do not believe in immediate operation, as pointed out by Dr. Ill. The sutures when put in hang like ear rings and do not hold the tissues well together. We should wait until we get the blue spot sloughed off. We should wait until there is drainage at the upper portions and then put in sutures in the skin as well as in the fascia and muscles. A third point I would refer to and emphasize is confining women in the cities. In my neighborhood I am sure there is not one woman in a hundred or even one in two hundred that is properly delivered. Usually, the doctor is in a hurry. He is a law unto himself. He may be cleanly. He may have a good knowledge of antiseptics, etc., but yet the woman suffers. We must educate certain members of our profession in regard to obstetrics. I am almost inclined to believe with Dr. Ill that

many women, if not the majority of them, would be better off if they were attended by midwives.

DR. ARTHUR J. SKEEL, Cleveland.—Dr. Ill just took the words out of my mouth with regard to what he said concerning immediate examination. The obstetrician is sometimes severely criticised for not making repairs of damages which a woman suffers at the time of labor. Of course, when a woman has a laceration of the perineum it is generally apparent upon inspection, but very frequently, when muscular separation has occurred beneath the mucous membrane, palpation and inspection immediately following labor do not show it. If we do not find any damage immediately after labor, two weeks later, if we will examine the perineum carefully, we will find that some damage has been done to the pelvic floor which was not apparent at the time. The perineum may have been so greatly stretched by the distention produced by the child's head in its passage, that the immediate examination may not show that she has suffered any definite damage.

DR. HUGO O. PANTZER, Indianapolis.—Without wishing to argue against the general trend of the Doctor's paper, and speaking simply to the point of relative proficiency in obstetrics, I recall the five months' experience I had at the Lying-in Hospital in Vienna in 1884 and in 1885. The midwives in attendance there would often attend thirty to forty cases of confinement before having any tears, and, indeed, tears were painstakingly looked for in each case. There is a great deal in proficiency in avoiding such accidents.

DR. CARSTENS.—Is it not because they give the women time to be delivered?

DR. PANTZER.—Yes, and secondly, because the patient is finally confined while lying on her side, not on her back.

DR. FREDERICK BLUME, Pittsburgh (closing the discussion).—It is rather peculiar that in this era of specialism the obstetrical specialist is but rarely called as consultant. The general practitioner, for instance, sends his patients with diseases of the eye, or of the nose and throat to specialists in these branches, whereas if advice or assistance is needed in complicated cases of labor, a friend, another general practitioner, is sent for. I asked an obstetrician, a specialist, what in his opinion is the cause of this condition. His answer was: the "odium of comparison." I add to this: the higher fee of the specialist. There is a great difference between the careful and expensive preparation for deliveries made by the specialist and by that of the general practitioner who is so very poorly paid for this kind of work. To avoid any comparison the specialist is not called.

One of the speakers said the immediate operation is not very successful; the lesions should be repaired ten or twelve days after delivery. In the large European Clinics the immediate repair of these injuries is the daily routine work and certainly very effective. Thus it will be here, if properly done. The introduc-

tion of one or two sutures through the skin, including a part of the torn vaginal tissue, must result in failure. The lochial secretions will get into the torn sulci, become decomposed, infecting the wound and preventing primary union. If the injuries are repaired immediately after labor the parts are numb, no anesthetic is needed. In cases of complete tears the operation is better done the day following labor, with better light and assistance, as I stated in my paper.

Some of the speakers expressed the opinion that these lacerations can be prevented in most cases by prolonging the last part of the second stage of labor; placing the patient upon her side, pressing against the head, slowing its exit and delivering it between pains. This method of delivery is well known and justly recommended as a prophylactic measure. But we all remember how this method disappointed us, how the perineum gave way like the proverbial wet blotting paper the very minute when we felt certain that we were going to avoid a laceration. The best we can say of these methods is: they are helpful under favorable circumstances, but the percentage of injuries of the pelvic floor is still large in primiparous women in spite of all prophylactic measures.

It has been said that the general practitioner is not sufficiently trained to successfully attend labor cases. I think we all admit this, but this is the fault of the medical schools and therefore I refrained from criticising the physician on this account. But if assistance is needed in a complicated case an obstetrician should be called, who through years of training is more competent to handle the case than the average practitioner. If in ordinary cases the medical attendant is not capable of successfully repairing the injuries of the pelvic floor it is his duty to call in somebody who is able.

I presented this brief paper to call your attention to a condition which demands the earnest consideration of the medical profession, that child-bearing women may be benefited by the teachings of modern obstetrics and protected against suffering and invalidism. I thank you for the kind attention given my paper.

*(To be continued.)*

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## ITEM.

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### PUBLIC CLINICS TO BE HELD IN THE AMPHITHEATERS AND OPERATING-ROOMS OF THE HOSPITALS OF THE DEPARTMENT OF PUBLIC CHARITIES, NEW YORK CITY.

ON and after the first of October, 1912, all clinics held in the amphitheaters and operating-rooms of the hospitals of the Department of Public Charities will be open to duly licensed



graduates in medicine and to the students in all regularly organized medical schools and colleges.

For the convenience of those desiring to attend the Clinics, cards of admission have been placed at the Academy of Medicine, 17 West 43d Street, Manhattan, and the Medical Society of the County of Kings, 1313 Bedford Avenue, Brooklyn, at which institutions they may be obtained on personal application by all regularly registered physicians.

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## REVIEW.

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A TEXT-BOOK OF OBSTETRICS. Including Related Gynecologic Operations. By BARTON COOKE HIRST, M. D., Professor of Obstetrics in the University of Pennsylvania. Seventh Revised Edition. Octavo of 1013 pages, with 895 illustrations, 53 in color. Philadelphia and London: W. B. Saunders Company, 1912. Cloth, \$5.00; half morocco, \$6.50.

Fourteen years have seen seven editions of this work. In its sixth edition related gynecological operations were added to obstetrics and now the author has greatly extended his chapter on the diseases of the breast. All this is extremely logical and practical. As the distinguished author states, all the diseases of women must be considered in relation to child-bearing and a large proportion of them are consequences of that process. Consequently the specialist in obstetrics should be an expert in every department of gynecology.

As we said of a previous edition—"For the man who wants much in small space and wants that clear, sane and practical we recommend this book."

A TEXT-BOOK ON THE PRACTICE OF GYNECOLOGY. For Practitioners and Students. By W. EASTERLY ASHTON, M. D., LL. D., Professor of Gynecology in the Medico-Chirurgical College of Philadelphia. Fifth Edition, Thoroughly Revised. Octavo of 1100 pages, with 1050 original line drawings. Philadelphia and London: W. B. Saunders Company, 1912. Cloth, \$6.50; half morocco, \$8.00.

The fact that in seven years five revised editions and five reprintings of this work have been required bears out in the most convincing manner the statement made by its author in the preface to his first edition that he believed there was a place for a practice of gynecology in which nothing should be taken for granted, which should state what should be done in every case, leave nothing to the imagination or common sense of his readers, and give directions and illustrations so explicit that they could be intelligently and easily followed. This extremely practical plan has been most literally carried out. The text is simply written. Operative measures are minutely described. The

illustrations are all diagrammatic and each has a purpose. They show clearly the advantages of simplicity when the object is primarily to teach. There is a good index.

The revision for this edition has been very thorough and in most respects is well up to date. The few points to which exception may be taken are largely matters of personal opinion. Thirty-four new illustrations have been added and forty-six removed. We know of no more satisfactory work for the general practitioner than this.

**THE COURSE OF OPERATIVE SURGERY.** A Handbook for Practitioners and Students. By Prof. Dr. VICTOR SCHMIEDEN, Privatdozent of Surgery in the University of Berlin, Assistant in the Royal Surgical University Clinic. Second enlarged edition. Octavo of 345 pages. Illustrated in black and color. With a Fore-word by Prof. DR. A. BIER. Translated and edited by ARTHUR TURNBULL, M. B., (Glasg.), M. A., B. Sc., Demonstrator of Anatomy in the University of Glasgow. New York: William Wood & Company, 1912. \$4.00.

*Mortui vivos docent*, the motto printed on the title page of this book, well expresses its reason for being. Operative surgery on the dead is and always will be a most important method for teaching surgery on the living. The author has included in his pages surgical technic only as practised on the cadaver. He has made the book concise by not discussing the priority of individual methods and has included names of authors only where they render matter more intelligible. Simple methods are preferred to complicated ones and much that we have considered classic has been omitted to make place for modern usage. The illustrations are excellent, the teaching clear, the translation into crisp English unusually happy. The translator well expresses the feeling of the book when he says: "The Surgical Tree of Knowledge had become too complex. The Berlin surgeon has accordingly pruned it of alternative methods and left only the stem that is common to all countries. He has summed up the essentials. He has refrained from crowding his canvas with details that can be mastered only in the operating theater."

**FURTHER RESEARCHES ON INDUCED CELL-REPRODUCTION AND CANCER.** Volume II, consisting of papers by H. C. ROSS, M. R. C. S. Eng., L. R. C. P. Lond., J. W. CROPPER, M. B., M. Sc. Liverpool, M. R. C. S. England, L. R. C. P. Lond., and E. H. ROSS, M. R. C. S. Eng., L. R. C. P. Lond. With illustrations. Octavo of 122 pages. The John Howard McFadden Researches. Philadelphia: P. Blakiston's Son & Company, 1912. \$1.00.

This volume is concerned with the elucidation of the theory that cell-proliferation and possibly cell-development are directly brought about by chemical agents set free by cell-death and is the third one published by its authors on the subject. Experiments are described which show how the previous work with individual

cells has been confirmed by experiments on animals and that swellings resembling tumors can be produced in living creatures by the action of the same chemical substances which induce individual cell-multiplication.

**THE CARE OF THE SKIN AND HAIR.** By WILLIAM ALLEN PUSEY, A. M., M. D., Professor of Dermatology in the University of Illinois. Small octavo of 182 pages. New York and London: D. Appleton & Company, 1912.

This well-written little book is intended to teach the laity certain facts in relation to the hygiene of the skin and hair. It does not foster either self-treatment or self-medication and can safely be recommended.

**THE MEDICAL RECORD VISITING LIST AND PHYSICIANS DIARY FOR 1913.** This very popular and most compact List is supplied for thirty or sixty patients weekly, dated or undated, and for ninety patients weekly, dated. It is bound in red or black morocco, or may be had in calf or seal if desired. Prices range from \$1.25 to \$4.00.

A list like this is a great economizer of time and trouble and may directly save many accounts by enforcing business-like methods in recording and presenting the same.

Besides the usual "front matter" it contains visiting list with special memoranda, records of obstetric engagements and practice, records of vaccinations, register of deaths, addresses, and cash account.

**THE PHYSICIANS VISITING LIST FOR 1913.** P. Blakiston's Son & Co., Philadelphia, 1913.

This List, which has been published for sixty-two years, is planned for 25, 50, 75, or 100 patients per week, the prices running from \$1.25 to \$2.50.

If can be had dated or undated, or arranged for monthly instead of weekly records. It contains tables of doses of incompatibility of poisoning, of quarantine periods, of first aid in asphyxia and the usual blank leaves for records.

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## BRIEF OF CURRENT LITERATURE.

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### OBSTETRICS.

**The Relation of Hypertension to Urinary Excretion.**—Lawrence (*Am. Jour. Med. Sc.*, September, 1912) presents the results of his observations in a series of twenty patients, all of whom had polyuria, albuminuria, cardiac hypertrophy, and an average systolic pressure of over 180 mm., for the purpose of ascertaining whether these would show any definite relation between the excretion of urine and the changes in systolic and diastolic blood or pulse pressure. During the entire period of observation the



daily amount of liquid intake and urinary output was measured and recorded, but the diet was not materially changed. As far as possible drugs were administered one at a time and the effects of each studied before another was added. All observations made during a period in which the patient's temperature was more than one degree above the normal were discarded, as it has been shown that an increase of temperature causes an increased rapidity of circulation. Where the pulse showed a change in rate of over eight beats per minute the observations were likewise discarded. The results seemed to show that no definite relation could be established between changes in systolic and diastolic pressure *per se* and variations in urinary output. There appears to be a definite relation between changes in pulse pressure and urinary output, for whenever the former increased in the presence of a falling systolic pressure there occurred a diuresis. The administration of a nitrite caused a diuresis even though the pulse pressure was somewhat diminished by the systolic fall. Under normal conditions the ratio of diastolic pressure to systolic is 2 to 3, and the ratio of pulse pressure to systolic pressure is 1 to 3, but under conditions of hypertension this ratio is destroyed. Whenever in the observations here cited the several pressures approached their normal ratios there was a rise in urinary excretion. These facts are not in accord with the generally accepted theory of the relation of blood pressure to urinary secretion. Lawrence claims that his observations show that excessive pressure not only does not cause increased flow through the kidneys, but in extreme cases may diminish it; moreover, that the destruction of large amounts of kidney substance or obliteration of the capillary circulation of those organs does not bring about an increase in blood pressure, and that a diminution of the hypertension of renal disease may cause increased function of the kidney. According to the generally accepted theories it would appear that renal function is dependent upon the pressure at which the blood passes through the kidneys, but Lawrence's observations make it appear that renal function is dependent upon the amount of blood passing through the kidney in a unit of time, and that the pressure is unimportant. This is in accordance with Fischer's theory, who believes that the rate of circulation is the controlling factor in determining urinary output and not the pressure under which the blood flowed. The explanation of the diuresis associated with increased pulse pressure, upon the basis of Fischer's theory, is therefore simple, for if the pulse pressure be increased, the efficiency of the circulation is enhanced and an increased supply of oxygen is therefore carried to every organ, its acidity is diminished, its affinity for fluid grows less, and diuresis results. In a similar manner diuresis obtained with a vasodilator may be explained, though in that case the increased oxygen supply is due in part to the action of the drug directly upon the heart.

**Metabolism in Pregnancy.**—Landberg (*Ztschr. f. Geburtsh. u.*

*Gynäk.*, Bd. lxxi, H. 1-2) presents an extended study of this subject which also includes a discussion of the liver function during normal pregnancy. He believes that the pregnant organism, both as a whole and in its individual parts, presents different physiological functions than in the nonpregnant state. Pregnancy cannot be compared with either a physiological or pathological condition. The peculiar requirements associated with this period call for processes which differ from those needed under normal conditions. These changes must not be regarded as a functional weakness in one or more organs, but on the contrary, Landberg claims that they constitute an evidence that the organism is able to adjust itself to the altered circumstances. The course of pregnancy under the physiological processes of the nonpregnant organism would be an impossibility. The author believes that we must look upon these changes in the pregnant organism as physiological necessities and that they must not be regarded from the pathological standpoint.

**The Sugar Content of the Blood in Genital Hemorrhages.**—Benthin (*Ztschr. f. Geburtsh. u. Gynäk.*, Bd. lxxi, H. 3) showed in a previous paper that the sugar content of the blood was increased during labor, although it was not above the normal during pregnancy or the puerperium. As the result of further experiments he finds that in the presence of slight hemorrhages from the genitals no increase in the sugar excretion from the liver results, but where the hemorrhage is severe a marked expulsion of sugar into the blood occurs if the hemorrhage does not last very long. But if it is continuous, conditions result which are similar to those experimentally produced by muscular action to the point of fatigue. In another paper in which this condition was studied during pregnancy, labor, the puerperium, and eclampsia, it was found that the increase of the sugar content of the blood in the latter was merely an expression of the increased muscular activity resulting from the convulsions.

**Endogenous Infection in Obstetrics.**—Pankow (*Ztschr. f. Geburtsh. u. Gynäk.*, Bd. lxxi, H. 3) contributes an extended paper on this subject based on bacteriological studies of cases in Krönig's clinic at Freiburg, as the result of which he claims that the possibility of an infection with endogenous organisms, whether spontaneous or artificial, cannot be denied. In primiparæ spontaneous infection with endogenous germs must be reckoned with in about 5 per cent. of all cases, even where the labor is uncomplicated. Where a vaginal examination has been made this must be increased to 9 per cent. In multiparæ with uncomplicated labors a spontaneous endogenous infection will result in about 3 per cent. of all the cases, which is increased to 5 per cent. where vaginal examinations have been employed. The increase in the number of such cases among primiparæ depends on the prolongation of the labor in this class and the greater damage to the tissues. A fatal spontaneous infection with endogenous germs cannot be excluded even in uncompli-

cated labors and was observed in two instances by the writer. It is impossible to state definitely what percentage of cases will be thus infected where operative delivery has been employed, but a comparison with the normal labors shows that where operative delivery has been found necessary the endogenous infection thus induced produces fever during the puerperium more frequently because the damage to the tissues offers a better opportunity for the invasion of these endogenous germs. In private practice the possibility for such infection is undoubtedly greater than among hospital patients, and it is no longer just, in view of recent observations, to attribute every case of puerperal fever to the person who has conducted the labor. Pankow believes that the expression "the infection always comes from without" should be interpreted to read that "danger is not to be attributed to the accoucheur but resides in the external genitals of the patient," and although the vagina is possessed of sufficient bactericidal power to destroy pathogenic organisms introduced from without, it loses this property during labor when the flow of blood and liquor amnii changes the composition of its secretions. Since the vagina and the vulva are no longer subjected to disinfection, no change for the worse in the morbidity during the puerperium has resulted.

**An Analysis of 3500 Cases of Abortion.**—McPherson (*Jour. A. M. A.*, August 31, 1912) presents his detailed observations in a large series of cases from the New York Lying-in Hospital, which were treated largely by operative measures. In his summary the author calls attention to the fact that abortions are much more common than is ordinarily realized and the sequelæ frequently more serious. After prophylactic measures have been given a trial and the threatened abortion becomes inevitable, the following statements seem to be proved by the study of this series of cases. That abortion is rarely if ever complete, for in only 13 per cent. of the cases analyzed was there the slightest reason to believe that the ovum was expelled unbroken and that every case of abortion should be carefully investigated and the uterine cavity explored. The mortality in all classes of cases which have come under the care of the hospital is 1.8 per cent. and in ordinary cases exclusive of accidents and malignant complications, it is .016 per cent. The most important result, however, is shown by the fact that in 97 per cent. of all the cases treated by radical measures, including thorough curetage, the result was satisfactory.

**Physiological Function of the Ovary.**—McIlroy (*Jour. Obst. and Gynec. Brit. Emp.*, July, 1912) presents the results of experiments undertaken to ascertain the physiological function of the different constituents of the ovary, special attention being directed toward the interstitial cells, with a view to finding out the influence of ovarian secretion upon other reproductive organs and upon the organism as a whole. The majority of the experiments were performed upon rabbits, rats, and guinea-pigs. The



results of the experiments were as follows: It was found that uterine function and nutrition seemed to depend on ovarian secretion, as atrophy occurred after removal of both ovaries, directly proportionate to the time the animal was kept alive after operation, the longer the time the more marked the fibrous changes. The muscular wall first showed atrophy, the glands disappeared gradually, but the epithelium lining of the uterus remained free longest. The mammæ and external genitals were likewise atrophied in these cases. The general development and nutrition were not affected by removal of the uterus or retention of the uterine fluid, neither were the ovaries. As follicular development and formation of corpora lutea took place the interstitial cells were not affected. No atrophy of the external genitals or mammæ followed removal of the uterus. McIlroy believes that there is no evidence that the uterus is responsible for the phenomena of menstruation aside from being the channel for the excretion of substances generated or controlled by the ovary itself. Compensatory hypertrophy following the removal of one ovary occurred in the other in the absence of pregnancy and in the presence of retained saline fluid from the uterus. The uterine secretion did not seem to have any inhibitory effect upon the growth of the ovary and did not counteract the atrophy of the uterus after removal of both ovaries. Ovarian grafts seem to prevent atrophy for a time but ultimate degeneration takes place in the transplanted tissue followed by the atrophy of the uterus. The rate of degeneration varies with the site of implantation, the more vascular the site the longer the persistence of the graft. Degeneration was found to take place first in the cells of the corpus luteum as evidenced by hyaline changes and leucocyte infiltration, while the follicles showed cystic degeneration. The interstitial cells seemed to persist much longer than the follicles and they appear to control the nutrition of the uterus, as atrophy takes place when these cells are degenerated and no atrophy results when they are present without any follicles.

**Insufficiency of the Liver in Pregnancy.**—Heynemann of Veit's Clinic in Halle (*Ztschr. f. Geburtsh. u. Gynäk.*, Bd. lxxi, H. 1) has attempted to demonstrate by chemical methods changes in metabolism, the presence of which would lead to the supposition that a so-called pregnancy liver exists and may be diagnosed as such during life. From a review of the literature and the results of his own experiments, Heynemann concludes that we are not justified in assuming that an otherwise healthy liver is subjected to any damage during pregnancy or that its functional activities are reduced during this period. Changes in normal metabolism are undoubtedly present during this time which call for increased activity on the part of the woman's system and the individual organs, but these are met by a compensatory physiological activity. Where the organs are insufficiently developed or have been previously damaged, this increased demand may not be fully satisfied, and it is only under such circumstances that direct

disturbances in the function of the organs result. This is particularly noteworthy in the case of the liver because of the extraordinary significance which this organ assumes in the body metabolism. Any regular and typical functional disturbance of the liver during pregnancy has not as yet been demonstrated, nor was Heynemann able by chemical methods to trace any connection between the liver and the toxemias of pregnancy, which leads him to believe that we are not justified in attributing to the liver any definite rôle in the production of eclampsia. This would seem to imply that the anatomical changes in the liver which are found in these diseases are not the direct result of functional disturbances.

#### GYNECOLOGY AND ABDOMINAL SURGERY.

**Hernias of the Ovary and Fallopian Tube.**—A. P. Heineck (*Surg., Gyn. and Obst.*, 1912, xv, 63) has reviewed the French, German and English literature from 1890 to 1910 inclusive and analyzes this and his own cases. He states that the Fallopian tube, the ovary, or the tube and ovary, in part or in their entirety, may be herniated. The degree may vary from a complete descent into a hernial sac of the tube, ovary, or tube and ovary, to a condition where herniated viscus or viscera lie just without the abdominal ring. The herniated tube, ovary, or tube and ovary may be the sole content of the hernial sac or there may be present as associated hernial contents, one or two or more of the following structures or organs: Meckel's diverticulum, appendix vermiformis, omentum, urinary bladder, small or large intestine, rudimentary or fully developed uterus. Tubal, ovarian, and tuboovarian hernias are congenital or acquired. These hernias, in a small proportion of cases, coexist with malformations, underdevelopment or absence of other internal or of some external genitalia, or pathological states of other internal genitalia or of some external genitalia or of organs other than the internal or external genitalia; these coexisting pathological states not having any relation of cause or effect to the hernial infirmity. Congenital or acquired hernias of the tube, ovary, or tube and ovary, may develop at any period of life. Torsion of the pedicle of a herniated ovary or of a tube and ovary gives the same clinical symptoms and determines the same anatomical changes as are observed in the strangulated hernias of the uterine appendages. The writer collected eight times as many hernias of the inguinal variety as of all the other varieties together. All the bilateral tubal, ovarian, or tuboovarian hernias recorded in the medical literature of the last twenty years were of the inguinal variety. All the hernias in which the complication "torsion of the pedicle" occurred were irreducible congenital inguinal hernias. All the femoral tubal, ovarian or tuboovarian hernias were of the acquired type and appeared in advanced adult life. Hernias

of the uterine appendages, in the absence of anomalies of the other internal genitalia or of the external genitalia do not, if the herniated adnexa be of normal development and free from disease, prevent conception, interfere with gestation, or unfavorably influence parturition. Pregnancy can occur previous to, during, and subsequent to, the existence of hernias of this nature. The etiology of hernias of the uterine appendages is that of hernia in general. The herniated organ or organs may be free from all degenerative changes, or may be bound to the sac-wall or to each other; may be the seat of congestion, gangrene, hemorrhage, inflammation, suppuration, tuberculosis (primary or secondary), cystic and neoplastic disease (benign or malignant). The herniated organ may be the seat of gestation. The hernial sac and the herniated adnexa may be the seat of an inflammation, suppurative or other in character, which owing to progression by continuity of surface has extended upward from the vagina, originating in the vagina or in the uterus, has reached the tube and ovary by way of the parametrial and parasalpingeal connective tissue. Pathological processes originating in the hernial contents may, owing to extension by contiguity of tissue, involve the sac and its overlying tissues. Pathological processes, primarily involving the sac or the overlying tissues, can spread to the hernial contents. The herniated tube, ovary, or tube and ovary, or the associated hernial contents may be the seat of morbid changes. Truss treatment for hernias of the uterine appendages is not curative, is often productive of discomfort, and not infrequently interferes with the nutrition and development of the herniated tube or ovary. Women who suffer from any form of hernia should be carefully watched before, during and after their confinement so as to prevent or rather minimize any undue strain upon weak regions of the abdominal wall. These women, at the close of lactation or toward the end of the first year following their confinement, should, in the absence of contraindications, be subjected to an operation for radical cure of the hernia. After the second year of life, spontaneous cure of hernias of the uterine adnexa is rare and can occur only if the hernial contents are easily reduced and easily kept reduced. In the female, all hernias irrespective of anatomical site, of clinical condition, or of nature of contents should, in the absence of a constitutional state contraindicating operations of election, be subjected to an operation for radical cure. Clinical conditions so closely simulating hernias of the uterine appendages that a positive diagnosis without operation appears impossible, should be subjected to operative treatment. In hernias of the uterine appendages, as in all other hernias, the ideal time for operation is previous to the development of degenerative or other pathological states in the herniated organ or organs, and previous to the occurrence of any of the various complications incident to hernias. Early operations give the most satisfactory results. The mortality of operations for the radical cure of



hernias, if performed at an opportune time and by a rapid operator competently assisted, is practically nil. To be effective, operations for radical cure of hernias must fulfill two essentials. The suppression of the sac and the strengthening of the wall through which the hernia has escaped. In all herniotomies, the sac should be incised and the hernial contents examined. In the female, the inguinal rings are comparatively small. They can, without inconvenience to the patient, be closed. Intra-saccular intestinal and other adhesions must be separated. The herniated abnormal tube, abnormal ovary or abnormal tube and ovary should be removed only if their return to the abdominal cavity is associated with peril, immediate or remote, to the patient or if these organs are so altered anatomically as to be functionally worthless. In the treatment of strangulated sciatic or gluteal, obturator and femoral hernias of the uterine appendages in which the hernial sac also contains gangrenous gut, a double operation is almost always indicated: a laparotomy for the repair of the intestinal lesions, and a herniotomy for the radical cure of the hernia. The herniated tube, ovary, or tube and ovary can be removed through the usual herniotomy incisions. The operative steps for the removal of these herniated organs correspond, short of a laparotomy, to the technic ordinarily used in salpingectomy and oophorectomy.

**A Case of Tubal Chorioepithelioma.**—Rossier (*Archiv f. Gyn.*, Bd. xcvii, H. 3) calls attention to the possibility of this condition, by reporting a case which is now the eleventh one noted in the literature. The patient developed evidences of a ruptured ectopic which subsided, however, and no operation was done. Subsequently the hematocele which had become infected ruptured into the large intestine and there were evidences of a rapid development of an abdominal tumor with marked pain and cachexia. The patient's condition being very weak, no operative interference was attempted and death occurred about six months after the original tubal rupture. The autopsy showed a large tumor in the lower portion of the abdominal cavity with adhesions of omentum and the surrounding structures, including the pelvic viscera. The neoplasm was found to be a chorioepithelioma originating from the tube, the other organs being involved secondarily. The possibility that this complication may occur prompts Rossier to urge a radical operation in each case where a diagnosis of ectopic pregnancy is made.

**Operation for Retrodisplacement of the Uterus.**—A. M. Willis (*Surg. Gyn. and Obst.*, 1912, xiv, 618) describes the following operation, which has been performed on over sixty cases. Each round ligament is grasped 1 1/2 to 2 inches from its uterine attachment and advanced to a point in the midline of the anterior surface and 1/2 inch from the apex of the uterus. A linen thread, on a small round curved needle, is passed through half of one round ligament, then through a good bite of the uterus, then through half of the other ligament. This suture is tied firmly,

bringing the round ligaments together. The same suture is continued downward, using broad ligament instead of round, for three or four stitches. At this point the uterus is left and the broad ligament is plicated to within  $1\frac{1}{2}$  or  $3\frac{3}{4}$  inch of the bladder. The suture is then drawn tight and tied. As a further reinforcement, an interrupted suture is placed so as to secure the round ligament to the uterus at a point half way between its original insertion and its advancement. In this operation the broad ligament is utilized to the fullest extent; the round ligament is advanced in its normal direction; the sutures are placed at the point of least vascularity of the uterus, thus avoiding troublesome bleeding, and the dangers of intestinal obstruction are obviated by the absence of abnormalities which may result in the entanglement of a loop of bowel. The writer has not observed the same pain and drawing sensations that have followed some of the older operations. In one case, explored two years after operation, the uterus was found to be in good position with the round ligament firmly attached. Most of the sixty cases have occurred among unmarried and sterile women, so only two cases of pregnancy are known to have followed. These were normal in every respect. There was one recurrence where catgut was used.

**Ovarian Tumor.**—E. L. Larkins (*Jour. Ind. State Med. Assoc.*, 1912, v, 266) records the removal, postmortem, of a multilocular ovarian cyst which filled and hung over the edges of a large wash-tub and weighed 140 pounds. The weight of the body after its removal was about 80 pounds.

**Prolapse of the Rectum.**—A. V. Moschcowitz (*Surg., Gyn. and Obst.*, 1912, xv, 7) regards prolapse of the rectum as in every essential a hernia and has devised the following operation for its cure. Median abdominal incision from symphysis to umbilicus. After opening the abdomen, the patient is placed in an extreme Trendelenburg position. The rectum is pulled up and held taut. Pagenstecher or silk sutures are passed circularly around the culdesac of Douglas, and tied. The lowermost suture is placed about 1 inch above the inferior extremity of the culdesac; similar sutures, six to eight in number, are passed at intervals, and persisted in as long as the peritoneum comes together until practically the entire pouch of Douglas is obliterated. It is advisable to include in the suture the pelvic fascia, particularly that part which covers the levator ani. When the sutures reach the region of the supravaginal portion of the cervix and body of the uterus, the sutures are anchored to these structures. When approaching the rectum, the sutures coming from the sides of the pelvis, catch the serosa covering it, in firm and close stitches. This is done in order to prevent the possible formation of a hernia; in addition, these lateral sutures also materially aid in fixing the rectum to the sacrum and coccyx. There are two structures which should be avoided, namely, the ureters and internal iliac vessels. The former can be marked by introducing

ureteral catheters; the pulsation of the latter serves as a guide. In older women the uterus is stitched to the anterior abdominal wall. No fixation of the intestine, viz., sigmoid flexure, is undertaken, as it is superfluous. Suture of the abdominal wall in layers. The after-treatment is simple. The bowels will generally move of their own accord in less than a week. Most of the patients require catheterization. In other particulars the after-treatment is that of any laparotomy. The writer has employed this operation in nine cases with one death from suppression of urine in a debilitated subject. He estimates the cures from the patient's viewpoint at 100 per cent.; from the surgeon's, he considers five cases as absolute cures. In the other three cases severe straining by the patient would cause the anus to open so that a narrow rim of mucous membrane was just visible.

**The Anatomy and Operative Technic of the Levator Fascia.**—E. Martin (*Arch. f. Gynik.*, Bd. xcvii, H. 2) of Bumm's clinic, discusses the shortcomings of the usual methods of operating for perineal lacerations. He claims that it is necessary to restore the fascial planes at the pelvic outlet just as we would repair a wound in the abdominal wall, because the muscles themselves exercise no supporting effect in this direction. The method in use at the Frauenklinik of the University of Berlin has been developed as follows: A U-shaped incision is made directly under the posterior commissure extending up on both sides into the lesser labia. This flap of skin and mucous membrane is then separated from the tissues underneath and the perineal body with the adjacent segments of the urogenital diaphragm is exposed. The finger is then used to dissect away the tissues until the fascial covering of the levator ani muscle is exposed. Sutures are then carried in from the edge of the urogenital diaphragm including the levator and its fascia, back through the former and out at the opposite side. The rectum thus remains untouched. The wound in the skin is then closed after removing the superabundant tissue. The advantages of the operation are stated to be as follows: During the procedure the various components of the pelvic floor are thoroughly exposed without the production of much hemorrhage because the larger vessels of the perineum and vagina are not touched. The chances of infection are likewise lessened because no hollow spaces remain. The fascial structure of this region is restored to its proper physiological proportions. Martin recommends this operation in all cases of descent and prolapse of the posterior vaginal wall and as a complementary operation in the treatment of displacements of the bladder and uterus.

**Prophylaxis and Therapy of Septic Infection.**—Heimann (*Ztschr. f. Geburtsh. u. Gynik.*, Bd. lxxi, H. 3) discusses the rôle of the peritoneum in the etiology of general septic infection and presents the results of a very extensive series of experiments in the effort to arrive at some definite conclusions as to the value



of various prophylactic and therapeutic measures. His results are as follows: The intraperitoneal injection of olive oil and camphor oil in animals was entirely negative as far as the absorption of virulent bacteria or their products was concerned. Moreover, the camphor oil was not harmless, as in the 10 per cent. strength it was fatal to the animals, and in a 2.5 per cent. solution it produced severe disturbances. Heimann does not believe that the prophylactic treatment of the peritoneum as proposed by Höhene and others is either free from danger or effective in this class of cases. Chemotherapeutic methods including the use of various silver salts and other chemical agencies, were likewise without definite results as regards the prevention and treatment of septic infection and although generally harmless were also found to be valueless. The treatment with antistreptococcus serum prepared according to Aronson's method and used in animals infected with the same streptococci used for the immunization, was usually favorable. In almost every case the injection of the serum, if used in proper amount and concentration, was of value in both the prophylactic and therapeutic sense, if employed at a time soon after the infection. Heimann's experiments on mice and other animals showed further that a specific serum is necessary in each case as the streptococci vary considerably. Therefore, only such a serum can be effective if used against an infection produced by streptococci which have been obtained from animals that have been immunized against the particular organism in question. Owing to the unsatisfactory status of the subject at the present time the treatment of septic infection must therefore be conducted symptomatically along clinical lines. Thus far no remedy has been found which is able to affect or destroy the streptococci which have infected the organism. Heimann believes that chemotherapy will in time afford relief, or a polyvalent serum will be produced which is effective against a variety of streptococci.

**Malignant Degeneration of Uterine Myomata.**—Hertel (*Monatschr. f. Geburtsh. u. Gynäk.*, September, 1912) believes that recent observations have shown that myomata cannot be regarded as benign tumors. Hertel reports a series of 1100 cases of myoma which came under his observation, among which 468 were operated upon, 176 treated conservatively, and 456 were not treated for various reasons. In twenty-nine instances out of the 468 tumors removed, malignant degeneration was present. In sixteen the uterine mucosa and in thirteen the muscular structures were involved. Moreover in this entire series, carcinoma of the cervix was found in eight cases. Sarcomatous degeneration was observed in thirteen of the women operated upon, and in no instance was it possible to make a diagnosis beforehand. In the majority of cases the submucous form of myoma underwent degeneration, as this is most likely to be subjected to irritation. Hertel considers that the frequency of malignant degeneration demands operative rather than conservative treatment in all

cases and that careful observation and early operation will furnish the most favorable results.

**The Treatment of Inflammatory Adnexal Disease.**—Töpfer (*Berl. klin. Wchnschr.*, September 2, 1912) calls attention to the advisability of conservative treatment in these conditions, unless the collection of pus can be readily reached; otherwise indications for operation must be postponed until conservative methods have been without well-marked results after being employed for considerable periods. In such cases the complaints of the patient and her social position must be taken into consideration. Two methods of operating are employed. In the milder cases where the uterus is freely movable and no marked adhesions are present, a double salpingectomy may be performed by the vaginal route. In severe cases a laparotomy is necessary but the uterus or a portion of the ovary should be retained. Solms has proposed a method for displacing the stumps extraperitoneally and completely shutting off the pelvis by the suture, by which the perineum from the posterior surface of the uterus and the adnexa is attached to the posterior wall of the pelvis above the culdesac. This provides effective vaginal drainage and avoids exudates and adhesions from the stumps. The more radical operation is only indicated in older women in exceptional cases.

**The Use of Pessaries.**—G. E. Herman (*Practitioner*, Sept., 1912) discusses the modern employment of these devices in a series of conditions. He believes that they are of extreme value in a rather limited class of cases and prefers the elastic ring pessaries and the ordinary Hodge pessary for this purpose. In nonadherent retroversions the symptoms will be relieved if the uterus can be kept in an anteverted position, but if the body of the uterus is merely pushed up no effect will be obtained. In slight cases of uterine descent Herman thinks that attention to the neurasthenic symptoms is necessary in addition to the local treatment. He advises a daily douche while the pessary is being worn and believes that the treatment ought to be extended over a few months at least. He believes that the effect of the pessary in distending the vagina is of more importance than any direct supporting action on the uterus.

**The Transplantation of Ovarian Tissue.**—Kawasoye (*Ztschr. f. Geburtsh. u. Gynäk.*, Bd. lxxi, H. 1-2) discusses the question whether a transplanted ovary will develop normally as compared with one which has remained *in situ*. These experiments were carried out on a series of rabbits and it was found that the transplanted ovaries, even where the healing was good, showed well-marked changes, usually of an atrophied character. He believes that these changes are explained by the diminished blood-supply which resulted. In the animals in which a portion of the ovary was left behind these changes were scarcely noticeable. He believes it is necessary therefore, that in an extirpation of the adnexa, the entire ovary or a portion of the same should only be left if the blood-supply can be maintained.

# DEPARTMENT OF PEDIATRICS.

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## ORIGINAL COMMUNICATIONS.

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### TRAINING OF MIDWIVES IN RELATION TO THE PREVENTION OF INFANT MORTALITY.\*

BY

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BEFORE proceeding with the paper which I have been asked to present, I wish to offer an apology to the audience for being here. Miss Carolyn van Blarcom, the executive secretary of the Committee on Prevention of Blindness of the New York Association for the Blind, was expected to present this subject, but prolonged illness has prevented her from doing so.

You will recall that Miss van Blarcom was the assistant secretary of the Section on Midwifery of the American Association for the Study and Prevention of Infant Mortality; when it came into existence, moreover, that she was instrumental in the organization of that section.

Her interest in the midwifery problem was excited through the investigations which were being made by the committee of which she is the secretary.

The many sad cases of preventable blindness directly traceable to the carelessness and ignorance of untaught midwives seemed to her of such vital importance to the future of many unborn babies, that this committee widened the purpose for which it was originally formed and financed by the Russel Sage Foundation, has been making a careful study of the midwife both here and abroad, particularly in England, as conditions now existing in America are strongly analogous to those existing in England prior to the passage of the act which provided for the control of midwives. This committee was greatly impressed by the simplicity and practicability of the English law, and by the fact that instead

\* Read before the International Congress of Hygiene and Demography, Washington, September, 1912.



of replacing obstetrical practice by the work of trained midwives it has increased, improved and upheld the work of the obstetrician.

The Midwifery Section of the American Association for the Study and Prevention of Infant Mortality, at a meeting held in Chicago in 1911, spent considerable time in the consideration of the midwife and the midwifery problem in America. In summing up the findings of this Section, we note that further study of the midwifery problem was suggested "before recommending any policy as to abolition or the recognition or supervision of the midwife." This apparently negative attitude appeared to leave the matter where it has drifted about in the past.

Fifty years ago the Medical Society of New York County voted almost unanimously against licensing the midwife. From time to time since then, quite generally throughout the United States, attempts have been made toward control and restriction, even abolition of this class of workers. Laws to this end have been framed and passed, but in no place do they seem to have been effectively or systematically enforced, as the midwife is found plying her trade throughout the length and breadth of the land. Every sickly ill-nourished infant, every babe with infected eyes or preventable deformity brought into milk stations, dispensaries or hospitals for which a midwife is responsible, adds fresh evidence against our apparent indifference and blindness to existing conditions.

Granting that the midwife problem is of too long standing to be settled hurriedly, and warmly advocating the most careful and thoughtful study of the ways and means toward the solution of this problem, nevertheless, we feel that the most ardent advocate of the abolition of the midwife could hardly bring an accusation of undue haste against those who have been brought to believe that society calls for her continuance and suitable education.

The history of the midwife is the history of the human race. Out from the dim obscurity of countless ages, she makes her appearance, officiating at the birth of the mighty. She dared assert herself even against Kings. When Pharaoh issued the order to the midwives saying, "Every male son that is born ye shall cast into the river." Puah and Shiprah defied him and outwitted him. If they had not, Moses, who afterward became the great Hebrew leader would not have found a safe resting place among the bulrushes, and been saved to lead his race to the Promised Land.

It would take too long to trace the history of the midwife down to modern times, when we find her in America, at least, pushed into the background by the medical profession, and a member of a class, with few exceptions, conspicuously ignorant and untaught and totally unfit to discharge the duties they are constantly called upon to perform.

Deplorable as this may be, in justice to the midwife, we find from all reports that midwives are responsible for less injury to mothers and children than that laid to the door of the medical profession. Dr. Williams says, "It appears that the majority of teachers in this country consider that general practitioners lose as many and possibly more women from puerperal sepsis than do midwives." The same seems to be true regarding preventable blindness and deformities. To quote again from Dr. Williams. "This is a terrible indictment against the medical profession." Yet, we find, in a recent editorial in the Boston Medical and Surgical Journal the midwife thus described: "The midwife may be defined as a person attempting to practice obstetrics, without complete, or even adequate medical education. The tolerance of such persons is an anomaly in an enlightened civilization. The midwife is a relic of medievalism, unhappily extant in the Old World, but whose persistence in our own community *should not be encouraged by any form of recognition.*" Nevertheless, even in America, they are attending approximately, 50 per cent. of all births. In New York City alone, 50,000 annually. Yea, even in the shadow of the "gilded dome," where the laws of Massachusetts are made which forbid them to practise, they are recognized on a birth certificate, and their signature accepted.

It is true that we have very inadequate statistics from which to form our conclusions yet we have sufficient to know that failure to recognize the existence of the midwife, or to ignore her existence amounts to little short of criminal negligence.

Dr. Baker, of the Child Hygiene Bureau of the New York City Department of Health, reports out of thirty-three states from which she has gathered statistics only thirteen could show that the practice of midwives is defined by law. Six of these knew the number practising and only four could state the number of births reported by them.

No one knows apparently how many are practising.

In New York City in 1911, there were 1344 permits in force, but district nurses, social workers and physicians feel confi-

dent that probably as many more are practising without permits.

The Old World has faced the problem with greater honesty and has provided adequate instruction for the midwives with laws for regulation and supervision. Excellent schools with courses varying in length from six months to two years, exist very generally in these countries, the laws of England and Denmark being particularly fine, and conspicuous for the class of women who enter the field. In Denmark, midwives practically control the practice of midwifery, and we find a remarkably low infant and maternal death rate.

"The value of trained midwives," to quote from Miss Van Blarcom, "is already apparent in England where twelve years ago conditions were strongly analogous to those in America at the present time. It is believed by English workers that the better obstetrical work being done by English midwives as a result of their better training and better control must be reckoned as one of the important factors in the decreased death rate among infants and mothers, the percentage having dropped from 151 deaths among infants per 1000 during 1901, to 106 per 1000 in 1910." A corresponding decrease in maternal deaths from puerperal sepsis and accidents of childbirth is also reported.

Contrast this with the state of affairs existing in America, 50 per cent. of our future citizens being attended at birth by a class of workers for whom we have provided no special opportunity for education. In the face of a social condition which is bound to perpetuate the midwife can we at present or for many years to come abolish them even if found possible under the American Constitution? Assuming that we cannot abolish them we must in all honesty recognize them, provide for their education, their regulation and subsequent supervision.

The question will be, and has been raised as to the wisdom of providing for the education of a third class of workers when physicians and nurses are already in the field. It must be remembered that midwives are also already in the field and for economic reasons seem destined—at least for the present—to remain. Therefore under the circumstances education seems only logical.

Better-trained physicians, extension of free obstetrical clinics and obstetrical hospitals, education of the laity and further development of visiting obstetrical nurses are some of the recommended substitutes. It would take years to accomplish



these reforms. Even then will they replace the midwife? If not the midwife, who? Will highly trained obstetricians practice on the East Side of New York or in the rural districts? Will the foreign-born woman, with all the inherited prejudices of generations against the "man-midwife" and a family of children clinging to her skirts enter the obstetrical hospital, or take advantage of the free obstetrical clinic? Even if she were willing, her husband would probably rise up and prevent her from doing so.

Education, excellent as it may be is discouraging, as every emigrant ship brings to our shores hundreds of others possessing the same inherent traditions and prejudices against hospitals and the man-midwife, while conditions in the rural districts remain the same, and where the mothers and babies of the poorer classes are subject to unparalleled neglect and suffering. Desirable as hospital care may appear to be for the poorer classes, we find, from such statistics as I have been able to collect, even in a great city like New York, with its millions of inhabitants approximately about 1000 beds for obstetrical patients, and although at times these are filled, there are many times when these beds are not filled. There seems to be little pressure, generally speaking, for more obstetrical beds.

Every teacher, both physicians and nurses, will acknowledge, I am sure, the uphill work encountered in establishing an active obstetrical service for medical students and pupil nurses in general hospitals. Out-patient services seem to be, upon the whole, more popular with the poorer classes.

The midwife may be gradually replaced by the combined force of these substitutes, but, in the meantime, she is here, and has been for ages, and here she apparently, expects to remain.

It is important that the difference between a midwife and obstetrician should be clearly understood by all. A midwife should never officiate at other than absolutely normal cases, but in order to be able to distinguish between normal and abnormal, she must, of course, have careful practical teaching. Neither would we wish to appear to be underrating the value of obstetrical hospitals, free clinics and district obstetrical work in the community. They are of inestimable value, not only to the public, but they play an important essential part in the general educational scheme of physicians and nurses.

If we would guard at the foundation the strength of the nation, we will no longer ignore the existence of the midwife and the part she plays in the social structure. All leading authorities,

in the question of infant mortality, agree that the prenatal care of mother, instruction to mothers in infant and personal hygiene, adequate obstetrical care and breast feeding are all essential factors toward a lowered death rate among infants. With characteristic waste of our natural resources, approximately one-half of our child life is under control before, during and after birth by a class of workers who have not been taught themselves, and who are, therefore, not prepared to give this fundamental teaching.

We must not condemn the midwife too harshly for her lack of training, as we again and again find her, without compulsion, making an effort to secure teaching and availing herself of such opportunities as present themselves, only to find that after spending money and time, she has been exploited and the few lectures she has heard and the pretentious diploma which she has received are of little practical value. In a country without standards, with inadequate or no laws for regulation and supervision, it would be preposterous to expect the midwife to be other than she is. Even the well-trained foreign midwife, as the stimulus of supervision is removed, lapses and becomes careless.

The arguments which have so far been advanced against the training of midwives, do not seem to those who believe in her education to be particularly sound ones. One eminent authority says, in speaking of a lowered maternal death rate, "It is not by educating the midwife to do better work, because we have seen that the mortality in the midwife's practice is not as great as in that in the hands of the medical practitioner." We cannot feel that this criticism of the work of the physician is any reason why we should discontinue the struggle for better medical education. If the midwife does better work untrained than the general practitioner, what type of work would she do after six months or one year of careful training?

It is also contended that the type of woman who would apply as candidates for training would be of such a low order that it would be a waste of effort since when trained they would gradually slip back into careless or ignorant ways.

It would be almost certain to occur, unless laws were made for control and careful supervision, such as we find in England, under the Central Midwives Board. Education means elevation and progress. It has not been a very long time since doctors were barbers and the nursing care of the sick was rescued from degradation by Florence Nightingale.

A very high type of woman enters the field of midwifery in England, at present many nurses superimpose this course upon their general training, and under the direction of visiting nurse associations and charitable organizations, work among the less highly favored classes in the large cities, and through the country districts as Queen's nurses. It has also been proved, beyond question, that trained midwives, instead of invading the province of physicians, as some members of the profession have feared, it has actually resulted in greater demands upon their services. The more highly trained and educated the midwife, the less willing will she be to assume responsibilities which are not hers, and the more quickly will she recognize them, and the greater discrimination will she show in the type of physician she calls to her assistance.

There seems to be no fundamental reason why the technically educated midwife should be feared any more than the technically educated physician or nurse. Any institution or profession, whether the law, medicine or nursing acknowledges an inherent weakness when present position or temporary success is considered before the great human cause lying in the background. It is not improbable to expect that advanced obstetrical training will eventually be given nurses in this country to fit them to carry their share in this problem of mothers and babies. A prophetic note was struck at the Chicago meeting last year by the Section on Nursing and Social Work, when a resolution to this effect was offered, but was finally held over for further discussion and conference.

If the midwife can gradually be replaced by the nurse who has, upon her general training superimposed a course in practical midwifery, which has been clearly defined by obstetricians, it would seem a logical economic solution of the problem, as we should not only save the expense of training another class of workers, but we should be able to provide better teachers, better nursing and eventually better medical assistance to the less highly favored classes.

The practical difficulties to be met in providing education for midwives are not inconsiderable. Two requisites are absolutely necessary—material and money. Our state and national government provide for the education of every known class from the feeble-minded to those desiring a scientific education. Why not for midwives? The school for midwives which was organized at Bellevue Hospital in July, 1911, is supported by



the city of New York. It is the first of its kind in America and has demonstrated that midwives can be taught and moreover that so far they have proved acceptable to the community.

Dr. John W. Brannan, President of the Board of Trustees, inspired by the investigations that were being made by the Committee on Prevention of Blindness, quickly advocated the training of midwives, and this little school, important as the entering wedge, was the immediate result.

In little more than a year the beds in the hospital have been increased from eight to twenty, and the work in the out-patient field steadily growing, while the individual experience shows that where the first midwife finishing a six months' course observed sixty cases and delivered eight, the last one finishing observed 104 and delivered twelve. In this school particular emphasis is placed upon the prenatal care of the mother and her surroundings, the nursing care of mother and baby, and the importance of breast feeding. The pupil midwives are required to do all the housework, thus acquiring a fundamental training in cleanliness, cooking, sanitation and hygiene.

Dr. Jacobi, in his masterly address to the American Medical Association in June, 1912, placed the stamp of his approval upon this venture and advocated in no uncertain terms, the wisdom of providing suitable education for the midwife.

Admirable as any provision for education may be, it will be a loss of effort without regulation and systematic supervision.

Education and legislation will surely mean the gradual elimination of the old familiar type of midwife. I venture to prophesy, although I may be wrong, that it will not be long before we see our cities and larger towns districted and covered by trained and certified midwives, working under visiting nurse or charitable organizations, with the same organization extending into the rural and mining districts. In the rural districts of the South, I see a distinct place for the certificated colored nurse, who now has considerable difficulty in securing nursing work. This work may even be under state or national control. Would it not be a wise economy and therefore a national asset, as long as babies must be born, and will be born, that they are born as healthy as possible? I would not have you misunderstand me, even the most optimistic individual would not expect that by the simple process of training midwives, to secure perfectly sound and healthy babies, but investigation has shown that she plays a vital part as a contributory factor, and that we can

no longer sit comfortably by and tolerate existing conditions. Our spirit of citizenship is at last stirred, the pitiful cry of the neglected infant has, at last, touched our hearts, and it is for this reason that we urge the education of women, whether as the midwife pure and simple, or as a further development of the nurses' work, in the practice of normal midwifery, not as a means of livelihood, "although every laborer (even a midwife) is worthy of his hire," but fundamentally as a protection to the strength and health and wealth of the nation.

BELLEVUE HOSPITAL.

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## THE RELATION OF PROLONGED PREGNANCIES TO SOME CEREBRAL LESIONS AND TO BACKWARD MENTAL STATES.\*

BY

HENRY LYLE WINTER, M. D.,

Cornwall, N. Y.

(With three illustrations.)

ROUTINE examinations of the mentally deficient always include inquiries concerning birth, especially whether it was normal or instrumental. Some statistics have been compiled regarding premature births, but I cannot find any literature on the subject of the relation of prolonged pregnancies to mental deficiency.

This probably depends upon the difficulty of obtaining exact information. This difficulty is apparent when I tell you that it has taken me over fifteen years to collect seventy-five cases in which I could be reasonably sure that gestation was prolonged beyond normal limits.

The subject of prolonged pregnancies itself has apparently attracted very little attention.

Inquires among medical friends develop the fact that about 5 per cent. of all pregnancies are prolonged beyond the normal limit. This is undoubtedly a movable percentage, and, of course, it is impossible even to guess at the percentage of prolonged pregnancies which yield mentally deficient children.

Out of 785 histories of mentally deficient children which I have collected seventy-five are known to have been born after

\*Read at the Annual Meeting of the First District Branch of the New York State Medical Society, Poughkeepsie, N. Y., October 4, 1912.

prolonged pregnancies. This is 9+ per cent. As suggested below in a brief analysis of the balance of the cases it is probable that more should be included in this group.

In examining these histories I find 46+ per cent. of idiots, 25+ per cent. of imbeciles, 5- per cent. of feeble minded and one-half of 1 per cent. of backward children presented histories of abnormal births. It is fair to assume that some of these abnormal births were due to some abnormality in the fetus, a large

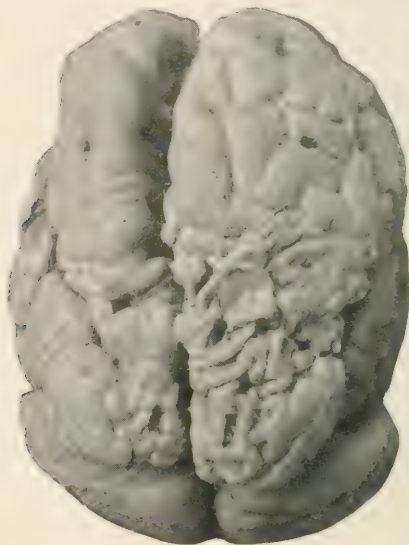


FIG. 1.—In this case the cystic degeneration completely destroyed the cortex and subcortical tissue as shown in the picture. Diagnosis: Diplegic Idiot.

head for example. As a large head would naturally result from prolonged gestation some of these cases are undoubtedly in that class.

The above percentages are calculated from histories of sixty-two idiots, 105 imbeciles, 143 feeble minded and 400 backward children.

The following are the periods of gestation in the seventy-five cases referred to:

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289 to 290 days	290 to 300 days	300 to 310 days	over 310 days*
6	22	30	8

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\* In one case in this group gestation was set at 330 days. As this exceeds the next longest period, 316 days, by so much I accepted it with doubt. The child weighed 16 pounds at birth. Labor was delayed but not instrumental. Third child of mother.



The weights, in pounds, at birth were obtained in thirty-three of these cases:

TABLE OF WEIGHTS.

4 to 6	6 to 8	8 to 10	10 to 12	12 to 14	14 to 15	16
3	2	4	13	6	3	1

The balance of the cases where the weight was not obtainable were classified as follows: Small children seven, average nineteen, large sixteen.

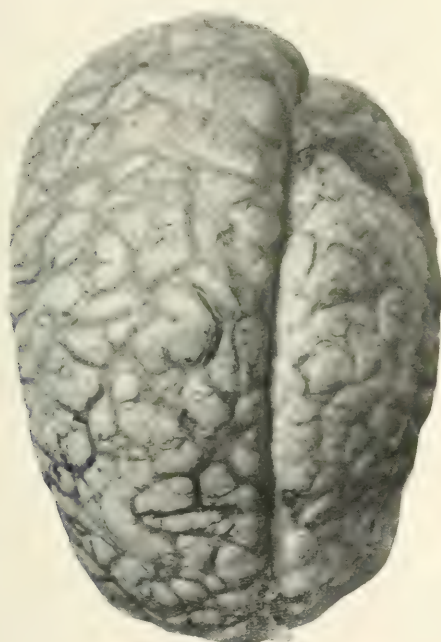


FIG. 2.

The brains which I have examined may be divided into three classes: Those presenting no gross lesions. These are few. Those in which the cortex and subcortical tissue are the seat of one or more areas of cystic degeneration. Third, a group showing unequal development of the cerebral hemispheres.

Out of seventeen brains examined two belonged to the first group, ten to the second and five to the third. Three of the brains of the second group came from the seventy-five cases above cited.

In the cystic group the lesions were all in the parietal or occipital lobes. This may have been merely a coincidence as there is no reason why they should not occur in any portion of the brain.\* The period at which the lesions occurred is, of course, a matter of conjecture. In some cases (Fig. 1) the conditions point to late fetal life, the convolutions appearing undeveloped rather than atrophic.

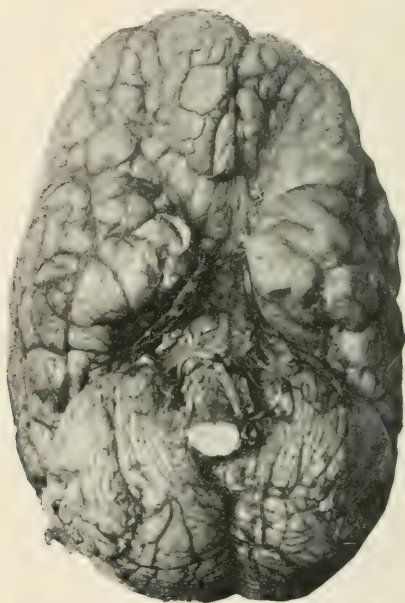


FIG. 3.

FIGS. 2 and 3.—An interesting feature in this case was an absence of any motor paralysis though the left hemisphere was clearly incapable of functioning. There were practically no motor fibers in the internal capsule. This compensation in one hemisphere for the lack of function in the other must have begun either in fetal life or soon after birth, before coordinate motion began. There is a cyst in this brain also. The opening into it shows as a dark spot in the occipital lobe.

The brains showing partial arrested development of one or the other hemisphere or of one or more lobes occurred in cases of asymmetry of the skull, the skull being flattened over the undeveloped brain areas.

In one case the right hemisphere was large and well developed while the left was less than half its size and the convolutions were flat and undeveloped (see Figs. 2 and 3).

\* It is possible that the lesions might have resulted in some cases from pressure of instruments during delivery in the posterior position. Not all the cases were instrumental, however.

As stated above there are cases which show no gross brain lesions, but in those cases in which the brain is injured the degree of mental deficiency bears a close relation to the amount of injury.

There is no doubt that the fetal brain may be injured at almost any period of development. It is certain that these injuries are more likely to occur during the later months. Pressure of the maternal parts is a probable cause. As it is obvious that such pressure increases with increasing size of the fetus it is reasonable to assume that an over-long pregnancy is in itself a menace to the mentality of the child through the possibility of cerebral injury while still *in utero*.

Over-long pregnancies therefore place the infant brain in jeopardy in two ways; through accident before birth and during it.

To avoid both of these dangers I urge the necessity of determining the date of the beginning of pregnancy in every case and the termination of it at term.

While it is not properly within the scope of this paper I take the liberty of suggesting that, where choice is possible podalic version is less likely to result in injury to the child's brain than forceps delivery.

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## POSTNATAL CAUSES OF INFANT MORTALITY.\*

BY

JOSEPH T. WALL, M. D.,

Washington, D. C.

SOMEONE has said, "There will always be an infant mortality." So long as the grim reaper exists, just so long will there be the toll of death from the ranks of the new-born and the nursling, and unless there be agitation and agitators to awaken the dormant sensibilities of those who have passed through and left in oblivion these early days of peril, and who in their blindness of ignorance, of apathy, or even of mercantile selfishness, neglect the problems of infant and child welfare, the sacrifice of the young will continue and leave its impress of ignominy upon the human race.

But it is reassuring to note and should stimulate the enthu-

\* Read before the Washington Obstetrical and Gynecological Society April 12th, 1912.



siasm of workers in this field, that the last few years have witnessed the birth and growth of a legion of conservators of the very young—the young human, as well as the young tree, to say nothing of the young calf and hog, the welfare of which has attracted an unwarranted amount of attention from economic and legislative bodies because of commercial possibilities.

From the *J. A. M. A.* of a recent issue we learn that the Hon. Andrew J. Peters, a member of Congress from Massachusetts, asked this rather startling question at a mass-meeting on child labor held at Louisville. "Are the children of the United States worth one-eighth as much as the bugs?" Mr. Peters showed that the Bureau of Animal Industry cost the country \$1,654,750 a year, and that the Bureau of Plant Industry cost \$2,051,686. The proposed children's bureau would cost \$29,440 and would investigate child labor, infant mortality, and other important phases of child conservation. It is being opposed, of course, by some manufacturers who want to employ babies in cotton mills, coal mines and other places admirably adapted for the growth of mind and body and the development of sturdy American men and women." It is gratifying to note that this bill for the creation of a child bureau has already passed the upper house and will probably become a law.\* There is an assurance as well to quicken our efforts toward the saving of the infant and child in the progressive lowering of the mortality rate not only in our own country and city, but in the foreign cities also.

The problems of infantile mortality deal with antenatal, neonatal and postnatal factors and it is to a consideration of the latter especially that I would ask your attention.

I have attempted in no way to accurately classify the postnatal causes but a natural grouping might easily be made into: first, the general mortality statistics and the specific postnatal causes of infantile death; second, contributory postnatal causes of infantile mortality.

Most of the facts to be considered relate to the first year of life as during that period the toll of deaths is immeasurably greater than at subsequent ones, and the greater part of this discussion will concern conditions existing in our own city, for as we sow we shall reap, nor should we forget that our efforts in study and in amelioration of preventable causes of death should, like charity, begin at home.

The population of the District of Columbia has increased from

\* This bureau has now been established.

about 160,000 in 1875 to 354,019 in 1911, while the ratio of white to colored has practically remained about as two and a half is to one.

In the early years following 1875, the average number of deaths under one year varied between 1000 and 1500 while during the past five years the average loss has been reduced to about 1000, notwithstanding that the population now is double that of the first year mentioned. This simply means that we now lose but half as many infants under one year of age as we did thirty years ago.

If studied in five-year periods we may tabulate these statistics as follows:

TABLE A.

The five years ending with 1883, loss (average)	1173.6	Rate on pop.	6.44
The five years ending with 1888, loss (average)	1260.0	Rate on pop.	6.10
The five years ending with 1893, loss (average)	1548.0	Rate on pop.	6.27
The five years ending with 1898, loss (average)	1420.8	Rate on pop.	5.17
The five years ending with 1902, loss (average)	1268.5	Rate on pop.	4.27
The five years ending with 1906, loss (average)	1165.0	Rate on pop.	3.61
The five years ending with 1911, loss (average)	1058.8	Rate on pop.	3.09

It is interesting to know the percentage of infant deaths as calculated from birth returns which in the last few years are probably fairly accurate statistics because of the increasing care in the registration of birth reports with the Health Office. This is shown by five-year periods in Table B.

TABLE B.

Five years ending 1883.....	32.77
Five years ending 1888.....	36.24
Five years ending 1893.....	35.71
Five years ending 1898.....	29.70
Five years ending 1902.....	21.73
Five years ending 1906.....	20.22
Five years ending 1911.....	15.12

In our own rate of previous years we shared in the heavy mortality of other cities where the colored race forms a large part of the population. In 1900, the rate per cent. in Cincinnati was 21; in Newark, 26.7; in Kansas City, 24.8; Fall River, 30.4 and among southern cities, as an example, Charleston, S. C., 23; Mobile, 27.1.

So far as the statistics abroad are concerned, they are better, taken both by countries and individual cities, than those on this side of the water, as may be seen by the accompanying tables.

*Infant Mortality and the Death Rate.*—The infant mortality of Germany and of Prussia is frequently placed as unusually high, and proportionally unfavorable conclusions as to the economic status of the population or as to insufficient hygiene are drawn. In truth such conclusions are a little hasty; the birth rate must be taken into consideration with the high infant mortality. Where women are overtaxed by frequent child-bearing, they can give less care to their children than in cases in which the number of children is small. If the birth rate and infant mortality are compared in the various nations together with the death rate with and without the death rate of infants, the latest figures give the following:

TABLE C.

	Deaths under one year, per 100 born living	In proportion to 1000 population		
		Number born living	Deaths, ex- cluding still- births	Deaths, ex- cluding infants
German Empire..... 1908	17.8	32.0	18.0	12.3
Austria..... 1906	20.2	35.0	22.6	15.5
Hungary..... 1908	19.9	36.3	24.8	17.4
Russia..... 1901	27.2	47.9	32.1	19.1
Italy..... 1907	15.6	31.5	20.7	15.8
Spain..... 1904	17.3	34.4	25.8	19.8
France..... 1906	14.3	20.5	19.9	16.9
England and Wales..... 1908	12.1	26.5	14.7	11.5
Netherlands..... 1908	12.5	29.7	15.0	11.2
Belgium..... 1907	13.2	25.3	15.8	12.5
Sweden..... 1907	7.7	25.5	14.6	12.6
Denmark..... 1907	10.8	28.3	14.2	11.2
Norway..... 1907	6.7	25.9	14.0	12.2

It will be seen at once that Germany has in no sense an unusual position in respect to the height of its infant mortality but Austria-Hungary and Russia present more unfavorable results.

*Infant Mortality in the Large Cities.*—According to statistics compiled at Amsterdam, that city has the lowest infant mortality among twenty large European cities, namely eight per 100 births. Next comes Paris with 9 per cent.; third, London with 10.2 per cent.; and fourth, Milan with 12.4. The highest figures are furnished by Moscow, 32.6 per cent., and St. Petersburg, 25 per cent.; then follows Breslau with 20.7; Munich, 19.2; Leipsic, 17.2; Vienna 16.4; Budapest 16.2; Berlin 14.6; Hamburg, 13.8; Dresden 13.3, after which follow Rome, Naples, Manchester,



Liverpool, Birmingham and Glasgow. As a whole, the infant mortality in the twenty cities during the last three decades has decreased as follows: In Munich from 36.9 to 19.2; in Breslau from 35.0 to 20.7; in Berlin from 31.3 to 14.6; in Dresden from 24.3 to 13.3; but in Moscow only from 34.6 to 32.6; in St. Petersburg from 29.9 to 25.0; in Vienna from 18.8 to 16.4; in Rome from 18.8 to 13.4; in London from 15.8 to 10.2; in Paris from 18.4 to 9.4, and finally, the very remarkable decrease in Amsterdam, from 24.5 to 8.0 per 100 births.

In Washington there has been a satisfactory and progressive decrease in the rate as computed on birth returns which is due in large part to a bettering of conditions bearing upon the morbidity from diseases of the respiratory and digestive organs as will be shown by a subsequent analysis.

The tender frailty of life of the infant is most strikingly shown by the fact that up to very recent years out of 100 born, thirty died before reaching the age of one year, and that of that 30 per cent., about one-third, or 30 per cent., died before reaching the age of one month.

There are certain diseases or groups of diseases which are especially fatal during the first year of life and naturally a study of these specific ailments, in their relation to infant mortality, would aid very greatly in pointing out the direction in which measures of preventive medicine should be taken.

If we group the various common morbid agencies in their five-year periods, there is a parallelism which is significant (Table D).

There are several interesting deductions to be made from an analysis of this grouping.

In the first place, the mortality statistics are improving and the most rapid march of progress is to be noted in the last few years, that period of awakening and enlightenment which has witnessed the greatest strides in preventive medicine.

It will be readily seen that the greatest toll of death is exacted because of diseases of the digestive tract and that of such diseases, those of intestinal disorders, claim the greatest number of victims.

The respiratory group is yet too large but has fallen considerably in the last five-year period, not because of a diminution of prevailing diseases of the respiratory tract, but probably because of the advent of common sense and fresh air in the treatment of such conditions.

TABLE D.  
AVERAGE NUMBER OF DEATHS PER 10000 INFANTS FOR PERIODS OF  
APPROXIMATELY FIVE YEARS.

Years ending	Digestive	Diarrheal	Convulsion	Respiratory	Circulatory	Measles	Whooping cough	Diphtheria	Scarlet fever
1883	289.	254.2	124.	157.4	1.40	1.20	17.00	15.20	3.60
1888	355.6	289.	86.2	135.4	1.40	13.80	29.40	9.20	3.20
1893	448.4	372.8	89.2	215.6	4.60	3.80	32.20	8.60	1.20
1898	424.6	370.8	102.4	201.4	6.40	6.00	24.60	15.40	1.40
1902	365.5	320.	80.5	206.75	8.75	5.00	28.50	6.00	1.00
1906	309.8	279.6	53.2	189.20	9.40	5.20	32.40	4.00	0.00
1911	282.4	254.2	24.8	166.	8.60	4.60	16.40	1.20	1.40

No doubt the ranks of the intestinal group could be enormously swelled by the addition of such reported causes of death as debility, marasmus, and prematurity, for among the well informed, the diagnostic nomenclature of infantile maladies has coined the term "feeding case" which includes in its definition by far the largest aggregate of infantile maladies.

That which stands out with greatest prominence among the contagious diseases is the mortality from whooping cough which is regarded, unfortunately, by the laity, and often by the physician, as an insignificant affection which the infant or child must contract and make the best of with about the same degree of certainty that he must, in the course of time, cut his teeth and bear the imaginary ills associated therewith. The utterly erroneous belief that the nursling infant is immune from infection by the contagion of whooping cough leads as well to a needless and excessive morbidity and mortality from this disease. It is extremely instructive to compare the mortality from this disease with that of the dread diphtheria which occupies a subordinate position as a cause of infantile death.

It has been my endeavor in the preceding discussion to outline the actual causes of infantile deaths as viewed from the standpoint of mortality statistics, with but little comment on the contributing causes to such fatalities, in the prevention of which very encouraging progress has been made in recent years. It is almost impossible in many instances to actually separate

the specific causes of infantile death from the contributory causes or conditions which are the direct antecedents of the morbid processes resulting in loss of life and which may yet be entirely hidden consciously or unconsciously in the statistical returns made to a Board of Health.

It is equally impossible to satisfactorily classify these contributory causes but an attempt may be made in that direction by considering them under the two headings of parental, and infantile.

The burden of reducing infant mortality is immeasurably increased in those cities which have a large foreign or colored population. The foreign element is the constant *bete noir* of those communities farther north, while in the South, which from this viewpoint includes Washington, efforts to better the death rate among infants must be redoubled because of the fact that we have to deal with a careless, ignorant and shiftless colored population, which has no antenatal "race suicide" but a frightful infant mortality which at times seems to discourage all efforts toward its betterment.

Approximately one-third of our inhabitants in this city are colored and over one-third of the infants of the same complexion. From the general standpoint of hygiene, the colored death rate should be and is, very high, while more specifically this race is the victim of rickets, so-called scrofula, and marasmic conditions which increase its discreditable mortality record directly and indirectly.

If infant death is to be lessened, parental health must be conserved. It is surprising to note the direct influence of parental ill health upon the descendants which prevails in such a large number of cases examined at the hospital clinics. This is not only shown in the devitalizing influences of maternal and paternal disease or ill health resulting from unhygienic surroundings, but as well in the transmission of direct disease, notably syphilis and tuberculosis from immediate or contact infection to the young offspring. We have seen syphilitic infection in four babies of a luetic mother notwithstanding insistent advice that she herself be subjected to treatment. I have in mind four cases of tubercular meningitis which could be traced to direct contact infection, all of these preventable conditions.

The "high cost of living" as a cause of infant mortality may at first sight seem a little sensational and far fetched, but such is actually the case as a brief reflection will easily convince you.



Whether it be extreme poverty or that circumstantial environment which leads to an income sufficient for the bare necessities of life, it reacts upon the health and welfare of the new-born child. Poverty means lack of early favorable conditions for the infant's health and growth; lack of proper obstetrical supervision and the substitution of unskilful midwifery with its attendant evils; if nursed from the breast, the baby feels the pinch of hunger which harasses the mother in an insufficient or improper maternal milk; if bottle-fed, the lack of dollars means lack of ice, bad and infected milk from the corner grocery conducted in most instances by the lowest classes of Russian Jews—and until that millennial dawn when poverty ceases to exist, there will be an infant mortality which needs no electric emblazonry in the sky to flash out its startling message that a baby dies each minute throughout the land.

Phillips of New York reports that in seven milk stations where careful records were kept of 466 cases, 70 per cent. of the families lived on five to fifteen dollars a week; 64 per cent. were housed in one, two or three rooms; 85 per cent. lived under conditions that were below normal; and 64 per cent. of the mothers were rated as ignorant. More instructive still are the figures of Levy, *Arch. of Ped.*, Jan., 1912, that in New York, among families with an income of \$5 or less, the death rate was 236; with an income of \$6 to \$10 the rate was 124; with an income of \$11 to \$15 that rate was 102; with an income of \$15 and over, that rate was 65.

I know of no statistical study of this subject in Washington, but I would make mention of a striking fact bearing on this question in our own city. The Health Officer has prepared a chart, which I cannot exhibit as he has sent the same in for publication, which shows a curve obtained from statistics published by the Department of Commerce and Labor based upon the cost of raw commodities for several years. Upon this curve is superimposed one which represents the infant deaths occurring in the first day of life, which naturally reflects the maternal influence upon the vitality of her offspring. These two curves almost exactly coincide to make a composite line and present a startling picture.

Space forbids a lengthy consideration of "maternal occupation" as a contributing factor in increasing the death rate among the infant population. Suffice it to say, that in those cities containing mills and factories, the mortality rates are unusually high, and while we in this community have no such

factor to deal with, we have in its place that of maternal occupation induced by domestic service which is equally pernicious in its influence.

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## TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

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### SECTION ON PEDIATRICS.

*Stated Meeting, of October 17, 1912.*

*The President, WM. M. POLK, M. D., in the Chair.*

### SUMMARY OF THE REPORT ON VITAL STATISTICS AND HEALTH REPORTS OF NEW YORK CITY.

DR. HAVEN EMERSON presented this report which was by the Public Health, Hospital and Budget Committee of the New York Academy of Medicine.

1. Vital statistics is the bookkeeping and accounting of the public health movement and a guide for administrative, legislative and social action.

2. The New York Vital Statistics are collected and tabulated by the Bureau of Records of the Department of Health. This Bureau is, in addition, charged with many other duties, and its staff is inadequate for a detailed, intensive presentation of the vital statistics of the city.

3. The information contained in the reports of the Bureau of Records is insufficient and loosely correlated. With regard to the classification of the material and the statistical methods pursued, the New York reports are inferior to those of Paris, and with regard to the interpretation and analysis of the statistics, they are much inferior to those of London.

4. The reports fail to tabulate essential information contained contained in the marriage, birth, death and sickness records which would throw important light upon many sanitary and social problems of the city.

5. Much of the statistical information of the various divisions of the Department is prepared independently by the several divisions, published separately, and not correlated with the essential data of the report of the Bureau of Records.

6. The tabulation areas of the reports of the Bureau of Records are boroughs, and in some instances city wards. In many cases these bases are inadequate for administrative, social and scientific purposes.

7. The two indispensable conditions for proper vital statistics

are: a correct count of the population and a correct registration of marriages, births and deaths. The first requirement is met by frequent censuses. In this city, outside of the federal census taken every ten years, we had a police census in 1895 and a Board of Health census in 1905, the data of the latter having never been published. Hence our rates are based on ten-year estimates. As to the second requirement, the registration of births in this city is still incomplete, and in the registration of deaths, there is no standard classification of occupations or of races by mother tongue, which would insure uniform, reliable and scientific information.

8. Physicians have not yet fully realized the importance of a correct vital statistics and the medical colleges and press have not laid sufficient emphasis upon its significance.

9. The Bureau of Records needs reorganization and a larger, well-trained scientific staff. The recommendations of the Advisory Committee of Statisticians, appointed by the Department of Health in 1911, for a subdivision of the Bureau into a Division of Records, a Division of Research and a Division of Publicity are very commendable.

10. The various publications of the Department of Health give a full description of the work of the Department but the delays in their publication detract a great deal from their value, especially for current administrative and social purposes.

11. The annual reports are usually several years later, and bear many signs of careless editing. The weekly reports have been, on an average, three weeks behind the time. The monthly reports also share in that shortcoming.

12. None of the publications of the Department of Health is designed to educate the masses of the people. They are of service to physicians and students of administration and sociology, but do not constitute a connecting link between the Department and the general public.

This is respectfully submitted by E. H. Lewinski-Corwin, Ph. D, Executive Secretary.

The following are the recommendations:

1. That the Department of Health reorganize and enlarge the present Bureau of Records in accordance with the recommendations of the Advisory Committee of Statisticians made in 1911, and subdivide the Bureau into three divisions, of Records properly, of Research and of Publicity.

2. That the Board of Estimate and Apportionment appropriate the money necessary for the enlargement of the Bureau of Records in the interests of efficient administration and the public health movement, and that the salaries fixed for the responsible officers of the Bureau be such as to enable the Department to secure well-trained men for the positions.

3. That the work of the reorganized Bureau be undertaken on a comprehensive scale and in accordance with modern scientific methods.



4. That all the scientific work of the department be done under the direction of the Bureau of Records to secure accuracy and uniformity of method, and that the records be promptly available.

5. That the reports of the Bureau of Records be published independently of the annual report of the Department of Health and be ready for distribution early every year.

6. That the city undertake a local population census every ten years beginning in 1915 and that a forty-acre tract unit of the last federal census be made the basis of tabulation.

7. That the medical press give more analysis to public health reports and vital statistics and impress the profession with the importance of exact vital statistics, urging them to cooperate with the Bureau of Records in making prompt, careful reports.

8. That the medical colleges instruct their students in the methods and principles of medical and vital statistics.

9. That the Department of Health make greater efforts to issue promptly its annual, weekly and monthly reports.

10. That the weekly report be changed from a purely statistical sheet to an educational pamphlet intended primarily for the general public, and that arrangements be made with the newspapers of the city for periodic reproduction of the essential parts of the report.

11. That more and better means of contact between the Department of Health and the public be established in the interest of efficient administration and of the public health movement, and that the public receive regularly information regarding the Department's most vital function—food and milk inspection, prevention of disease and care of babies and school children.

#### THE ETIOLOGY OF CONVULSIONS IN EARLY LIFE.

DR. FLOYD M. CRANDALL read this paper. He said that in few conditions was the determination of the causation more important than in the convulsive disorders of children, because in a large proportion of the cases the knowledge thus gained would lead to prevention. The practitioner was prone to look upon these conditions too lightly and to feel that they were passing episodes which merited little anxiety. Death during a convulsion, while rare was sufficiently frequent to demand every precaution. Of equal importance was the fact that if the cause was not determined and proper measures taken to prevent repetition, grave results might follow. Gowers reported 180 cases of epilepsy which began during the first three years of life and among 460 cases of epilepsy studied by Osler, 187 had their beginning in the first three years of life and seventy-four in the first year. The predisposing causes of convulsions in children were very potent. Among these the first was age. The brain of the new-born infant was out of all proportion to the body weight. The child was born with one-third the bulk of its adult brain, while its body was frequently not more than one-twentieth the adult weight. Almost the second third of the brain was

acquired during the first year of life and nearly the full weight was gained by the seventh year. The child in its second year with almost two-thirds of its adult brain substance had not one-hundredth of its functional power. Control by the higher centers was very slight at the outset. Thus the anatomy and physiology of the child's brain predisposed to uncontrolled nerve disorders. The first seven years was a most important developmental period. The pathological conditions incident to this period were convulsions, night terrors, stammering, liability to sudden rises of temperature and numerous other abnormalities resulting from enormous growth without adequate control by the higher nerve centers. The diseases incident to this period were chorea, epilepsy, somnambulism, migraine and certain eye defects. The second predisposing cause of convulsions was heredity. This was a very potent and important cause. The children in some families were particularly subject to convulsions and nervous manifestations and the practitioner learned to look for them in succeeding generations. In some of the cases the inherent tendency was so strong that prevention of an occasional convulsion was very difficult. The fate of the child was sealed before birth and no professional skill could overcome these defects. Nevertheless something could be done for all and some could be saved entirely from these inherited tendencies. The third predisposing cause of convulsions was rachitis. A tendency to convulsive disorders was sometimes a very early symptom and appeared before physical signs were well marked. In every case of convulsions rachitis should be searched for and active measures for its relief instituted. The author then considered the general causes. The first were the organic diseases—meningitis, hydrocephalus, hemorrhages, embolism, thrombosis, abscesses, tumors. Meningitis presented this symptom oftener than the others. The convulsions of new-born infants were often the result of cortical hemorrhages due to birth injuries but they might be due to septic infection. The second class of exciting causes were the reflex. While he felt positive that children were not infrequently disturbed when they were cutting their teeth, he felt equally positive that dentition alone very rarely caused convulsions. The same might be said of phymosis. The effect of reflex irritation of undigested food masses in the alimentary canal was uncertain. He could not help thinking that irritating masses of food might of themselves induce convulsions through the agency of reflex action. More commonly, however, the symptoms were due to toxemia. The indication for treatment was to get rid of the undigested food and then it might be determined whether the convulsions were due to reflex action or to toxemia. The power of worms to cause convulsions was another question which might be open to discussion. But the indication in such cases was clear. Get rid of the worms at once and then evolve a theory as to what they had done. The third group of exciting causes was toxic. Of these uremia might be

considered first. Nephritis was most common after scarlet fever but might follow any of the other infectious diseases. In certain cases of grippe particularly when complicated by intestinal infection, it was not unusual to find marked nephritis. The acute infectious diseases might be accompanied by convulsions occurring more commonly at the outset. This was particularly true of pneumonia. In malarial fever in a young child a convulsion might take the place of a chill. Of the contagious diseases, pertussis was the one most commonly complicated by convulsions. In these infectious diseases the convulsion was apparently due to the specific poison which produced the disease. Of all the exciting causes the one most frequently present was that of undigested food in the alimentary canal. The convulsion was more often due to toxemia than to reflex action. The bacteria might not enter into the blood but the ptomaines which they generated were absorbed and acted as true poisons. The proteid elements of the food were the especial offenders and the poisons which they generated were particularly virulent. In conditions allied to the simple convulsions, notably tetany and laryngismus stridulus, the same predisposing etiological factors were present. In these two disorders, however, rachitis had been believed to be of special importance. He was of the opinion that some other factor must be present. These conditions were rare and rachitis was common. The factor or inherited unstable nervous temperament was certainly important. In his last case of laryngismus stridulus, the mother was a frail neurotic woman who suffered from puerperal mania both before and after the birth of the child. Craniotabes was present but there was no other distinctive sign of rachitis. Strong evidence had recently been adduced that they were on the track of the other factor to which he had referred. The rôle played by the inorganic salts, particularly calcium, was apparently a potent one. The practitioner was not doing his full duty when he was content simply to bring a child through the seizure. Not only should the immediate causative factor be determined, but the underlying cause as well. The practitioner was remiss who neglected to use every precaution to prevent farther seizures. In some cases the underlying predisposing causes were so potent as to render the child subject to a convulsion upon the most trivial exciting cause, while in others only the onset of acute illness or grave digestive disturbance would precipitate an attack. The attending physician should not forget the dictum that careful investigation would enable him to do something for every patient and everything for some patients.

#### GENERAL REMARKS ON THE PATHOGENESIS OF CONVULSIONS AND ALLIED CONDITIONS.

DR. MAX G. SCHLAPP said that there was no doubt but that all had seen single cases of epilepsy occurring in children that



were apparently caused by intestinal worms and after the removal of the worms the epileptic attacks disappeared. When at the age of six or more epileptic attacks often appeared not due to intestinal worms but to other causes. The same might be said regarding teething or irritations from the stomach. The subject was very complex, one that had many causes. It was well known that organic lesions in the cerebral cortex, hemorrhages, tumors, gliosis, etc., produced convulsions in children. But when we consider the fact that often they were due to some reflex irritation, or due to things not understood, then we were entering a big field which required deep investigation.

Epilepsy occurs more frequently during early life. When it occurs later it is termed "epilepsy retardans." Most cases of "epilepsy retardans" were due to some organic lesion of the brain, especially those lesions resulting from hemorrhages, tumors, gliosis, syphilis, and so on. Idiopathic epilepsy developed during early life and not after the age of thirty years. In answer to this he considered three questions which presented themselves as follows: The functional, the formative and the nutritional; each of these he considered more or less in detail.

1. The formative. In this each cell divided and formed two new cells.

2. The functional. In this each cell was shown to be capable of taking up some sort of substance in the body and keeping it as potential energy.

3. The nutritive. Here each cell used up this potential energy and converted it into, or translated it into, kinetic energy.

There was something in the body which regulated these three processes, something that regulated the formative activity, and that something was a chemical substance. This formative activity was very active and marked in the early period of life. Growth ceased perhaps on account of the presence of a certain hormone; the stimulation to activity of this certain hormone retarded the formative activity.

There was a class of glands in the body which were very important in retarding the growth because they produced and developed these hormones; these were the glands which controlled the individual's sex characteristics. Some of these hormones retarded the formative activity.

With regard to the nutritive activity, there were substances which controlled as well the functional activity. There was something, or some things in the system that kept the balance of nerve cells constant. Dr. Schlapp then gave some examples which showed that there was something in the system which kept the balance of nerve cells constant. He spoke of hyperthyroidism and its effect upon the functional activity of the motor neurons, and those contained in the vagus in particular, where the action was tremendous. There was the excitable nature of the individual. If strychnine was administered there

would be at once an enormous lowering of the activity of the peripheral motor neurons. There was the same sensory impression in cases of strychnine poisoning brought about by a similar tremendous activity. They could arrest the activity of motor cells by the employment of certain chemical substances. Take, for instance, morphine. There was one very interesting point in this connection, all the neurons did not react alike to the different hormones. It should be born in mind that the nervous system was made up of a number of groups of nerves which reacted to a great number of poisons. The musculospiral nerve was one of those especially affected by lead, thus showing that there was something selective, and, in addition, there was always a functional activity. Epilepsy was always the index of central motor neuron activity.

Further, children who had suffered an attack of measles or scarlet fever often showed signs of an encephalitis and the question arose whether or not it was due to some lesion in the cortex because of the convulsions. When the symptoms of these diseases disappear the convulsive attacks disappear. One case he recalled was that of a child in whom the convulsions continued to increase and finally the patient developed dementia or amentia, an instance of another type of functional activity.

When the resistance was lowered by the presence of some toxin in the body, there occurred a progressive gliosis, and this was an organic lesion which resulted in many of the cases of epilepsy.

Were these cases due to organic lesions? Were they due to lesions resulting from hemorrhages, hydrocephalus, and other conditions? It was a curious thing that hemorrhages in some individuals, or gliosis, or hydrocephalus, each of which might involve the motor cortex, produced no epilepsy or convulsions. There were many cases in which the brain cortex was irritated and yet there occurred no epileptic attacks.

Experiments upon animals had been made proving that epileptic attacks could be produced by injection of certain substances such as urea or carbonate of ammonium into the blood, and the amount injected was a very important factor in bringing about the attack of epilepsy. Why? Because it lowered the functional activity of the motor cells. It was Knanski who reported this experiment.

Dr. Schlapp presented a chart which showed the diseases due to hypothyroidism and hyperthyroidism. In the former were included cretinism and myxedema; in the latter, cyanotic conditions including struma, etc. He said that he did not intend to go into the condition of hypo- or hyperthyroidism but he did wish in a general way to bring out an important factor—the influence of functional activity in bringing about certain conditions, conditions that were unquestionably due to some disturbance of the internal secretions.

DIETETIC TREATMENT OF CONVULSIONS AND ALLIED CONDITIONS  
OCCURRING IN INFANTS, WITH SPECIAL REFERENCE TO  
THE RÔLE PLAYED BY THE INORGANIC SALTS.

DR. CLIFFORD G. GRULEE of Chicago presented this paper. He recalled that in 1905 Finkelstein had noted that the irritating portion of the diet seemed to be in the whey of cow's milk. This finding he had confirmed. It was a general belief that the calcium and magnesium salts acted antagonistically to the sodium and potassium, the former tending to allay nervous irritability, the latter to increase it. When there was a relative increase of calcium and magnesium over the increase of sodium and potassium, one would expect to have a decreased nervous irritability. This he expressed by the formula  $\frac{\text{Ca}}{\text{Ma}}$  or  $\frac{\text{Ca} + \text{Ma}}{\text{Na} + \text{H}}$ .

The opposite of this proposition would also be true. The means by which nervous irritability could be most accurately estimated in infants and in animals was by the electrical reaction. It had been definitely determined that in infants suffering with spasmophilia KOC was less than 5 ma., while the AOC was less than ACC. Taking this hypothesis it was determined to approach the subject of spasmophilia by endeavoring to produce increased electrical irritability by the use of sodium salts, but previous to doing this it was thought that a study of the metabolism of the inorganic salts in animals before and after parathyroidectomy (thereby showing markedly the reaction of the electrical current) would be of interest. Young dogs were chosen for the experiments, preferably females. The period previous to operation and the period after operation were observed. In all cases the first period was three days. A two-, three-, or four-day period was observed after operation. The food consisted of milk preserved by the addition of 1-10,000 formalin, and at no time showed any gross signs of decomposition. In all excepting one instance the dog was given as much as it would take. The urine and feces were collected and careful analyses made in twelve cases which the author reported in detail. From these experiments he drew the following conclusions:

1. In dogs in which there is a hyperirritability of the nervous system, as shown by the increased electrical irritability, and as produced by removal of the parathyroid glands, there is no regular variation in the formula,  $\frac{\text{Ca}}{\text{Na}}$ , or  $\frac{\text{Ca} - \text{Mg}}{\text{Na} - \text{K}}$  before and after operation, as shown by metabolic experiment. While in three dogs thus examined there was apparently some support of the proposition that the quotient of this formula was increased during the period of hyperirritability of the nervous system, in the fourth dog no such reaction could be noticed.

2. In the estimation of the salt content of the brains of the five dogs, the first being a control, there was regularly found a



decrease in the calcium content in the thyroidectomized animals. In one instance, however, the formula  $\frac{\text{Ca}}{\text{Na}}$  was less than that of the controlled animals.

3. No variation in electrical irritability nor severity of the convulsive period could be demonstrated by intraperitoneal injections of normal sodium and calcium salts in the quantity of 40 or 45 c.c. of sodium salts, and 2 to 4 c.c. of calcium salts in twenty-four hours.

4. Even under normal condition, when carefully estimated the electrical irritability in dogs varies quite widely.

5. While food containing whey is distinctly irritating to spasmophilic infants, the sodium and potassium salts corresponding in quantity to those contained in the whey did not regularly produce the increased electrical irritability which one would expect were the sodium to be regarded as the irritating substance in the whey.

6. This failure of the sodium and potassium to produce results may be explained either by the fact that the forms in which the sodium and potassium were given, *i.e.*, NaCl and KCl, were not readily absorbed by the gastrointestinal canal, or that these salts were not in themselves the irritating factors. The latter proposition would seem to be much more probable.

It would be seen therefore, that these experiments had brought little or no confirmation of the hypothesis that the increased electrical irritability in spasmophilia was the result of a disturbance of calcium and sodium equilibrium.

#### DISCUSSION.

DR. L. EMMETT HOLT expressed his appreciation of the experimental work done by Dr. Grulee and of his clinical work in the dietetic treatment of convulsions and allied conditions occurring in early life. What was most needed now to clear up the problem were careful metabolic observations upon infants suffering from these conditions. It was difficult from experimental work upon dogs to draw inferences with regard to what took place in the child. Dr. Grulee's observations related to one single type of convulsions, *viz.*, those occurring in infancy associated with spasmophilia. They formed but a small percentage of the cases of convulsions seen.

The commonly held opinion regarding the seriousness of single attacks of convulsions he thought was erroneous. In hospital practice single attacks of convulsions were matters of daily occurrence, and were seen in a very great variety of conditions, most of them not being especially significant or important. He thought this was also true in private practice. It was interesting and significant in following up to later childhood patients who had had a number of attacks of convulsions (during infancy)

to discover in how small a proportion of them epilepsy developed. Osler and Gowers had both emphasized the frequency with which epilepsy followed infantile convulsions. While it was no doubt true that a very large proportion of patients with epilepsy gave a history of infantile convulsions, in Dr. Holt's observations the number of children suffering from infantile convulsions who subsequently developed epilepsy was surprisingly small. Of 157 cases of convulsions occurring in infancy and early childhood occurred in private practice which had been followed up, only ten had subsequently shown evidences of epilepsy.

He emphasized the value of lumbar puncture in the diagnosis as to the cause of convulsions and insisted upon its performance in every case of prolonged convulsions; only by this means could it be determined whether the cause was meningitis or some other form of cerebral disease or whether the convulsions were due to some reflex cause. Again, lumbar puncture was of considerable therapeutic value in cases of severe prolonged convulsions since in practically all of these cases there was a greatly increased pressure in the cerebrospinal fluid and the withdrawal of one-half to one ounce often produced very marked and immediate improvement.

Convulsions rarely proved fatal *per se* unless associated with enlarged thymus.

DR. HENRY DWIGHT CHAPIN said that there were convulsions and convulsions and the kind that Dr. Holt had referred to were those that so often occurred in their hospital service but were only ephemeral in their effects. A point that he wished to make, was that in many cases the ultimate result of prolonged convulsions was epilepsy. In many of these cases there occurred a rupture of the meningeal vessels of the cortex; as a result there was an effusion which eventually produced a serious irritation of the brain, a condition which he had verified at autopsy in several cases.

Dr. Chapin thought that one important point brought out was that every convulsion occurring in children should be treated seriously and, so far as the management was concerned, the child should be brought out of the convulsion at the earliest possible moment.

DR. LINNAEUS B. LA FETRA said that as regarded the causation of convulsions and allied conditions, particularly cyanosis, it had been his experience that in young infants, leaving out of account meningitis and intracranial hemorrhage or the onset of acute infections, these conditions arose most frequently from four separate causes; from prolonged pressure at the time of birth, with probable intracranial edema; from gastrointestinal auto-intoxication; from sepsis with or without resulting brain lesion, and from inanition.

The convulsions due to intracranial hemorrhage, either meningeal or cerebral, would appear very shortly after birth in most instances, but in case the hemorrhages were very small in

amount, convulsions might not manifest themselves for several months.

With regard to convulsions from edema of the brain, Dr. La Fetra said he had no verification of this theory by autopsy, but in two cases which he had seen and followed in which there were localized or general convulsions, the most striking physical sign was a tense bulging fontanel and a lack of pulsation. After four or five days, the pulsation returned in the fontanel and the bulging disappeared. Coincidentally, the convulsion ceased and the babies recovered entirely.

The convulsions due to gastrointestinal intoxication and those due to sepsis were so well recognized that no description was needed, but occasionally the sepsis was accompanied by thrombosis or hemorrhage, and, in these cases, a bloody fluid was obtained by spinal puncture. One would be led to suspect the condition when there was irregular respiration, the absence of pulsation in the fontanel, together with bulging and increased tension. He had personally seen two such cases, one in private and one in hospital practice.

Premature babies or those that were too weak to nurse well were subject to attacks of mild convulsions and cyanosis, not connected with any brain lesion and, in several instances, it had been found that giving the breast milk which was not taken in sufficient quantity by gavage or by means of the Breck Feeder was followed by a cessation of the attacks.

As regards teething, he had never seen convulsions in an infant that could be attributed to teething alone; it was, however, unquestionable that many infants, particularly those that were nervous or of a neurotic heredity, were much more susceptible at the time of teething to gastrointestinal disturbances and to otitis media; it was very likely that this indigestion was at the onset of nervous disturbance of the secretion, or else a result of the fever which in such infants frequently accompanied the eruption of a tooth. As a result of the gastrointestinal indigestion, or of the otitis, convulsions might occur and such cases were not at all unusual, but there was always evidence either in the stools or in the ear, that the convulsions were due to something more than the irritation of the gums.

The convulsive attacks of infantile tetany were usually diagnosed without difficulty by the appearance of the child, by the attacks of laryngospasm and by the facial and elbow reaction. Very recently, however, he had had a case of spastic amaurotic idiocy which simulated very closely the appearances of infantile tetany. In this case, however, the electrical reactions were not exaggerated and an examination of the eye grounds showed the characteristic red spot at the macula.

A very unusual complication of convulsions which it seems worth while mentioning occurred in a patient of his six years ago. For some years he had been subject to attacks of vomiting and convulsions associated with intestinal indigestion. At the



end of a particularly severe attack of convulsions in which he had been given a high intestinal irrigation, the patient suddenly began to vomit coffee-ground fluid, having a fecal odor. He went into partial collapse and, since the appearance suggested an acute intestinal obstruction, a surgeon was called into consultation.

He found on examination that the stomach was very much distended and made the diagnosis of acute dilatation of the stomach or gastric ileus. A stomach tube was passed and fully a quart of coffee-ground feculent fluid was evacuated. After thorough lavage of the stomach with hot saline solution, the vomiting ceased and the danger was over. Unfortunately, however, the boy had inhaled some of the vomited material, so that he suffered in series, an attack of pneumonia, then abscess of the lung, and finally empyema. Although such a complication must be exceedingly rare considering the frequency of convulsions, it was one to bear in mind and would suggest that the stomach tube should be at hand ready for use as well as the rectal tube for the high irrigation which was the most generally useful measure in the case of convulsions in older children. As regarded the dietetic treatment suggested by Dr. Grulee, he had had no experience.

DR. FOSTER KENNEDY.—One should not in his opinion get into the habit of thinking or believing that the infantile convulsions so repeatedly seen belonged to any clinical entity or definiteness. In every case of infantile convulsions they should have the clear idea in their minds not only what was the etiology but also if possible what brain area was affected?

With regard to lumbar puncture it was very important in every case of convulsions accompanied with fever to do this operative procedure at once. It should be determined immediately whether the case was one of polioencephalitis or cerebrospinal or tuberculous meningitis. Diagnosis could then be made precise with a one in three chance of cure.

He wished to enter a strong plea for the early and frequent use of the ophthalmoscope. He had seen many children blind through postneurotic optic atrophy in whom there was a history of headache and convulsions at perhaps the age of five years with gradual subsequent loss of vision. These were undoubtedly cases of conglomerate tubercle with a tendency to cure. Had the exact cause of the convulsions been determined, decompression could have been done, the sight preserved and the natural progress of cure not interfered with. The history of these cases of convulsions occurring in early life made him believe that the use of the ophthalmoscope should be more often resorted to.

One must remember also that hysteria is almost physiological in the child. It was very difficult to state definitely whether the convulsions were the results of epilepsy or whether they were of a hysterical character. However, Dr. Kennedy thought that it was worth while to mention a fact that he knew to be

true and one that had not been mentioned in the text-books— if during the hour after a convulsive attack one got a change in the type of plantar reflex it was significant of the attack having been of major epileptic nature.

It seemed to him that it was right to give chloral or some other sedative to these children. Even if these children had but a small number of convulsions in early childhood later in life they were often followed by epilepsy. He believed that convulsions allowed to go unchecked in infancy, readily gave rise to cortical instability and the epileptic habit in later life.

DR. CLIFFORD G. GRULEE of Chicago closed the discussion. The cases he reported he wished to be understood as being of a purely spasmophilic nature and as representing but one type of convulsions. Spasmophilia was a very common condition and often accompanied by laryngismus stridulus.

The question regarding the etiology of epilepsy was a very peculiar one. Birke reported fifty cases of spasmophilia that were seen at the Breslau clinic. He followed these from ten, twelve or fourteen years and in no case did epilepsy develop. He then took up the true cases of epilepsy and followed them down and found, on the other hand, that convulsions did occur in childhood; but that the convulsions appeared in rather a peculiar manner, a single convulsion at intervals of a week, or a month, or even longer. But there were not the repeated convulsions such as occurred in spasmophilia proper.

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## TRANSACTIONS OF THE WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.

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*Meeting of April 12, 1912.*

DR. SPRIGG *in the Chair.*

The essay of the evening was read by DR. JOSEPH T. WALL on

### POSTNATAL CAUSES OF INFANT MORTALITY.\*

DR. DONNALLY in discussing the paper noted the hopefulness of the decrease in mortality during the past thirty years. He spoke of the infant as the product of heredity, food and environment. Mothering was next most important to the food of the infant. The care given by the child's own mother could not be duplicated in any institution or by any foster mother. The purity of the milk was of great importance.

DR. MORGAN called attention to the point brought out by Dr. Wall that nurslings were not immune to the infectious

\*See original article, p. 1063.

diseases. Even scarlet fever could be contracted by the nursing though infants were apt to be immune. Dr. Morgan also noted that although the proportion of mothers that nursed their children was decreasing yet the mortality of the infants was decreasing. This he interpreted as indicating better artificial feeding.

DR. WILLSON said that the study of infant mortality needed the ideas of many specialists to get the best results. He considered as noteworthy the comparison of the small mortality of diphtheria and the enormous mortality of whooping cough. He spoke also of the natal or prenatal mortality from intrauterine causes; and quoted statistics that 80 per cent. of conceptions failed to come up to full-term pregnancies, and viable births. Then there was a very large mortality from inherited disease and mechanical causes at birth. He had heard it said by a reputable physician that at present a woman stood a better chance of the safe delivery of her infant at the hands of a good midwife than in the hands of many practitioners of medicine.

DR. ABBE called attention to Dr. Wall's chart showing the increase in the colon bacilli in the pasteurized milk during certain periods of the year to a greater number than there were in the raw milk and wondered if the pasteurization did not lead to neglecting the milk supply in other ways or lead to additional handling of the milk which was the cause of more harm than good.

DR. VAUGHAN said that the charts of Dr. Wall showed that the chief cause of infant mortality lay in the feeding. He also noted that the infectious diseases caused the deaths of infants in exactly the reverse order to what is generally attributed to them: viz.: Diphtheria 1.20; scarlet fever 1.40, measles 4.60, and pertussis 16.40 per 10,000 infants.

DR. SPRIGG called attention to the frequency and seriousness of the pneumonias with whooping cough.

DR. WALL in closing said that the excess of the colon bacilli in the pasteurized milk was probably due to the neglected milk supply or inefficient pasteurization. As to the traumatism at birth the increased medical attention at labor had not improved the mortality of the infants during the first month of life. In 1879 when the midwives were caring for the greater number of the labors the mortality within the first month of life was thirty while in 1910 when the majority of the labors were cared for by physicians forty per 10,000 of the deaths occurred within the first month. The best method for the prevention of infant mortality lay in the education of the mothers. Dr. Churchill made a speciality of caring for infants and was called in on the day of the baby's birth to regulate its feeding from then on through the first years. In the poorer classes the care of the babies was done through nursing conferences held in the milk stations where the mothers were attracted by the offer of free milk and the doctors weighed the babies, watched them and talked to the mothers about the care of their infants.



## REVIEW.

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MONOGRAPHS OF THE ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH. No. 4. A CLINICAL STUDY OF ACUTE POLIO-MYELITIS. By FRANCIS W. PEABODY, M. D., GEORGE DRAPER, M. D., and A. R. DOCHEZ, M. D., New York, 1912.

This monograph is based primarily on the study of acute poliomyelitis which was made at the Hospital of the Rockefeller Institute for Medical Research during the summer of 1911. But it includes also a review of that portion of the literature which has a bearing on the clinical aspects of the disease.

The section of epidemiology contains a number of interesting suggestions. The writers believe that the nasopharynx and tonsils are portals of entry for the disease as shown by the experiments of Flexner and Clark. The following paragraph summarizes their ideas of the mode of transmission of the disease. "The infection can be carried and implanted by active and passive carriers; being resistant and having access to external nature with mucous secretions it can become attached to dead objects, bedding, clothing, etc., and to domestic pets and domestic insects (fly); and it can be ground into dust and conceivably be disseminated by wind."

The chapter on pathology is complete and in accord with the researches of Harbitz and Scheel, Wickman, Shauss, Ressler, Flexner, Flexner and Clark and Mallory.

In the absence of a classification based purely on clinical symptoms or pathological lesions, the writers recognize three main groups of cases. The first group consists of the *abortive cases*, cases of infection which never become paralyzed. The second embraces the *cerebral group* in which involvement of the upper motor neuron causes spastic paralysis. The third group—*bulbospinal*—comprises all cases with lesions of the lower neuron and flaccid paralysis. As the writers mention, this classification is open to the objection that many cases are not purely of one type either clinically or anatomically; but all classifications thus far devised are open to similar objections and the one advanced by the writers has the great advantage of simplicity. The symptomatology is dealt with on the basis of this classification and is treated in an exhaustive manner. The prodromal (preparalytic) symptoms are carefully analyzed and this section contains information which should be of great aid in making an early diagnosis of the disease. Of special interest is the chapter devoted to the cerebral types (polioencephalitis) in which the important symptoms are given and the relationship of this variety of the disease to the pure bulbospinal type is discussed.

According to the investigations of the writers the blood of patients with poliomyelitis showed a constant and marked

leukocytosis. In several instances the count was as high as 30,000. Other writers have described leukopenia as the most pronounced blood picture but such was present in only one of the cases studied by the writers of this monograph. They also demonstrated a constant increase of the polymorphonuclear cells of 15 to 20 per cent. Otherwise the blood changes were in no way characteristic.

The spinal fluid during the early days of the disease and especially before the onset of paralysis showed an increased cell count with a normal or low globulin content. Most fluids contained almost exclusively lymphocytes and large mononuclear cells, although at the early stage of the disease there may be as many as 90 per cent. of polymorphonuclear cells. After the first two weeks the cell count drops to normal, or nearly normal, and there is frequently an increase of the globulin content which may persist in slight degree for seven weeks or longer. All of the fluids examined reduced Fehling's solution.

Since the disease is unquestionably infectious the writers advise strict isolation of the patient, and the general precautions usually taken to prevent the spread of any contagious disease.

As would be naturally expected with a disease for which there is no specific therapy, the treatment advised by the authors contains little that is new. The general treatment is that for any acute infection. The diet is liberal when the patient's appetite demands it. The pain due to passive motion is prevented by care in handling the patient and in changing the linen. The spontaneous pain is often relieved by wrapping the painful limb in cotton wool; blankets, hot water bottles, hot packs and hot water bags may give great comfort. When drugs are required bromides are helpful in younger children. In older patients, phenacetine, aspirin, codein and occasionally hypodermics of morphine are necessary.

The paralyses are treated by rest, massage, and later, by active or passive movements. Of greatest importance is the prevention of contractures and deformities by means of carefully applied orthopedic appliances.

On the whole, this monograph contains a most satisfactory review of our present knowledge of poliomyelitis and includes much original material derived from the study on which it is based.

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## BRIEF OF CURRENT LITERATURE.

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### DISEASES OF CHILDREN.

**The Operative Treatment of Fractures of the Long Bones in Children.**—Sampson (*Lancet*, London, Aug. 17, 1912) reports the results of the operative treatment of fractures according to Lane's

method as employed in his service. Seventy-two children, varying from one month to twelve years, with fractures of the long bones were subjected to operation and in no instance did wound infection result. The mortality was nil and radiograms in two planes at right angles to each other were taken both before and after treatment in all cases. A metal plate was used for fixing the fragments in sixty cases and subsequent removal was necessary on two occasions. In one case the plate caused a projection beneath the skin of the forearm in a position liable to frequent injury and friction and was removed two and one-half months after operation. In the other case an ununited fracture of the tibia of five months' standing was found with both ends of the bone atrophied and the lower fragment a mere shell. Recent fractures from subsequent examinations show that perfect results were obtained in over 88 per cent. of the cases, malunited and ununited fractures giving a perfect result in over 37 per cent., which is claimed by the writer to furnish a strong argument in favor of the adoption of early operative measures as a routine procedure, because if resorted to after malunion has taken place the chances of a perfect result are greatly diminished. Perfect function resulted in 97 per cent. of recent fractures and in 50 per cent. of malunited and ununited fractures. In view of the results a more extended adoption of Dr. Lane's methods for the treatment of simple fractures is urged.

**The Treatment of Asthma in Children.**—Knopf (*Berl. klin. Wchnschr.*, August 12, 1912) in calling attention to this not uncommon affection, believes that the treatment should be largely directed to insistence on proper breathing. The principal evidence of the asthmatic symptom complex is shown by the disturbance in the relation between the thoracic and abdominal respiratory movements. While the former are engaged in inspiration, the latter are undergoing expiratory movements. In addition to overcoming this part of the disturbance it is also necessary to insist on proper nutrition and digestion, it being essential that the stomach is thoroughly emptied before the child goes to sleep. Any disturbances in the nervous system which may be present must also be adjusted and the effect of the child's environment studied, a change in climate being indicated both for its physical as well as its psychic effects. Although asthma in children is apt to disappear at the time of puberty, the interval is accompanied by much discomfort and possible anatomic changes which cannot be corrected.

**Infantilism with Chronic Interstitial Nephritis.**—Naish (*Brit Jour. Child. Dis.*, August, 1912) refers to the increasing attention which is being accorded to the association between these conditions and reports two personal cases. The cases thus far reported seem to show a definite relationship of infantilism with polyuria and polydipsia. Albumin is usually present and very often rickets. In the cases which come to autopsy the kidneys are



small and fibrotic, and death usually follows a condition of uremia with more or less complete suppression of urine. The infantile characteristics are usually pronounced but the mental attitude and intelligence vary.

**Traumatic Separation of the Epiphyses.**—Kirmisson (*Presse méd.*, Aug. 7, 1912) says that caseous traumatisms have especial peculiarities in the child. Points that should be specially considered are the fact that the ossification and development of the bones is not as yet complete. The presence of the epiphyseal cartilages causes the bones to be composed of several different portions placed in juxtaposition, and not of a single piece; separations of these epiphyseal cartilages may take place. Another fact of importance is the thickness of the periosteum in the child and the resistance which it offers to traumatisms, thus causing subperiosteal fractures. The *x*-rays have proven that separation of the cartilages actually occurs. In very young infants this cannot take place, because the epiphysis does not as yet exist except as a mass that is quite supple and attached to the diaphysis by a periosteum that is very thick and is not easily torn. From the second year up to adolescence separation of the epiphysis may occur, sometimes combined with true fracture. This is always caused by indirect violence, with twisting of the epiphysis or lateral inclination of the limb. The cartilage generally remains attached to the epiphysis, and the periosteum is detached considerably from the bone. The periosteum may even be so torn as to let the extremity of the diaphysis pass through it. Differential diagnosis may be made from fracture by the fact that instead of a marked and loud crepitation we get an irregular, dry, rough rubbing sound, similar to that heard in arthritis. The lesion occurs so near the articulation that it may be easily mistaken for a dislocation, the displacement being the same. The shortness of the diaphysis renders replacement of the fragments difficult, and the periosteum may become ossified so as to maintain the deformity. There is a large effusion of blood into the wound, on account of severe lesions of the blood-vessels, and very great swelling of the parts. In fractures of the leg the diagnosis is difficult, but the prognosis is good, the displacement being small, and crepitation absent. The Dupuytren fracture does not exist in the child.

**Importance of Marine Hospitals in the Treatment of Surgical Tuberculosis.**—Jacques Calvé (*Arch. de méd. des enf.*, Aug., 1912) insists on the value of the seashore with its equable climate, sunshine, and cool air in the treatment of surgical tuberculosis. The tendency to consider surgical forms of tuberculosis as local is an error. Tuberculosis is always a general disease and requires general and hygienic treatment, and the fact that the disease has become localized in the bones or joints instead of the lungs is not a reason for abandoning general treatment and confining the care to orthopedic and other forms of surgery. The equable, sunny seashore climate is of the greatest value in the treatment

of bone and gland tuberculosis. We must reenforce the resisting powers of the organism if we are to cure the disease. The air acts as a stimulant, and causes oxidation, and remineralization of the system. The mildness and equability of the climate allows the patient to live in the open air all the year round. The sunshine is a valuable therapeutic agent. In all kinds of tubercular adenitis, whether suppurating or not, a rapid retrogression of the tuberculous process takes place at once, which continues, although more slowly for months, several years being necessary in severe cases to secure a complete cure. In closed bone abscesses resorption of the pus takes place spontaneously in many cases. In others a few medicated punctures are needed. In fistulous cases the parts are left exposed to the sun and air without dressing in the day, being covered with a light compress at night. The effects are due to purity of the air and freedom from dust, and its oxidizing properties. After a few weeks sojourn in the sunny, open galleries the children take on a healthy color, have a good appetite, and a flourishing appearance. Many cases are reported in detail. The author laments the small number of hospitals devoted to the care of such cases at the seashore, and says that many more are needed. He advocates the establishment in connection with such hospitals of schools where these patients when recovered may be taught trades and occupations which they may exercise in their more or less crippled condition, in which they will not relapse or become reinfected as they would in the crowded regions of cities. Such patients are more or less handicapped and should receive special aid in this direction.

**Radical Treatment of Umbilical Hernia in Children.**—Vittorio Brun (*Arch. de méd. des enf.*, Sept., 1912) advocates a new method of radical treatment of umbilical hernia in young children. He makes use of an elastic ligature placed about the redundant navel mass, so arranged that it is subcutaneous, and that its contraction causes a gradual cutting off of the blood supply and nutrition, with the gradual formation of a cicatrix, which is entirely subcutaneous, and does not show externally. The rubber ligature is inserted threaded into a curved needle and passed half-way around the navel; a second entrance of the needle carrying it around the other side, and the whole drawn tight and fastened with silk. The elastic ligature is sterilized by immersion in alcohol and glacial acetic acid. In a few days all the hernial parts are cut through, while adhesions are established in the peritoneum which seal off the cavity. After two weeks the entire ligature may be removed through the inferior wound, left open for that purpose. A complete cure is established and the trouble will not recur. The author has seen 244 hernias operated on by this method in children from two months to nine years old. Age has no influence on the result. The sooner it is attempted the better the result. The operation is simple, painless, and efficient. It can be done in five or six minutes; in small children

no narcosis is necessary, while chloride of ethyl is sufficient in older children. Few of the patients need to be kept in the hospital, most of them going home and being visited there.

**Pure Oxygen in the Treatment of Apparent Death of the New-born.**—Paul and Jean Delmas (*Jour. de méd. de Paris*, No. 28, 1912) have made use successfully of a method of establishing respiration by the introduction of oxygen from a tube, combined with artificial respiration. After removing all mucus from the throat and mouth of the child, one assistant clasps his hands about the thorax of the child, while it is laid on its back, and at regular intervals compresses it by his fingers pressed into the front, and thumbs into the back, producing a forced expiration, inspiration coming from the elasticity of the thorax. A second operator holds under his arm a rubber bulb filled with oxygen from which a tube runs into the mouth of the child. This balloon is rhythmically compressed as the thorax is expanded, causing the oxygen to enter the lungs of the child. In country practice, where oxygen in cylinders is not easily obtainable, the same procedure may be carried out by the use of peroxide of sodium, which on being dissolved in water gives off a large amount of oxygen, 10 grams giving 2 liters of oxygen. Oxygen may even be injected subcutaneously or introduced into the rectum. The result of the use of oxygen has been the regularization of pulsation and increase of strength of the heart action, combined with a regularly established respiration.

**Dried Milk in Feeding of Infants.**—E. C. Aviragnet, L. Bloch-Michel, and H. Dorlencourt (*Arch. de méd. des enf.*, Sept., 1912) give the results obtained by them in feeding infants with dried milk in the form of powder. It has been administered to both healthy and sick infants with all grades of intestinal troubles. The powder is made by the evaporation of milk in a vacuum, and consists of a yellowish-white powder, very light and having the odor of cooked milk. It may be used in three forms, according as it is made from whole milk, or that from which all or one-half the cream has been removed. It is dissolved in sufficient water and given in increasing dosage after a small dose has been found to agree. It has proven of service in summer especially; because, being sterile, it has not the dangers of contamination and fermentation to which ordinary milk is subject in hot weather. In normal children it gives as good results as ordinary milk; in dyspepsias it gives as good or better results as milk. In cases of vomiting it is of especial value because it can be given with very little water, almost in the form of a dry diet. In this milk the sugar is not changed, the fat remains much the same, but the casein is rendered much more digestible, as is the case with other forms of albumin that are cooked. Toxic albumins may be rendered innocuous by cooking them. In treating a sick child we give the dry powder immediately after the water diet. Digestive ferments may be used with advantage in combination with this milk.



**Retroperitoneal Lymphosarcoma.**—The importance of a case report by H. K. Hill (*Arch. Pediat.*, 1912, xxix, 682) lies in the fact that it records the complete failure of treatment by Coley's fluid, the mixed toxins of the streptococcus of erysipelas and bacillus prodigiosus. Affirmed cures are not infrequently recorded; the failures, which have seemed to be in the large majority, do not gain publicity.

**Influence of Food upon Intestinal Flora of Infants.**—A. Friedlander and J. V. Greenebaum (*Arch. Pediat.*, 1912, xxix, 673) present a study of two marantic infants. The foods used, albuminized milk and simple modified milk (fat 2 per cent.; sugar, 7 per cent.; proteid, 3 per cent.) had very little influence on the biologic reactions of the fecal flora as a whole. There was, however, a slight lessening of the putrefactive reactions on the 2-7-3 modification. The acidophilic flora remained about constant on both foods. Finkelstein's food is buttermilk with the salts and sugar reduced and a high percentage of finely divided proteid. To a great degree the beneficial effects of the food depend upon its lactic acid content, and in giving the food we are really using lactic acid therapy. The lactic acid bacillus flora formed during its administration was continued when the food was changed to 2-7-3, because in the latter instance the lactic acid was formed from the sugar. In other words, with both foods lactic acid therapy was given, so that it is not surprising that the bacteriologic reactions were similar in both instances. In striking contrast to the slight changes in the intestinal flora there was a remarkable change in the clinical aspect of the two cases. The general condition improved greatly, as did the gross character of the stools. On the Finkelstein food there was moderate but steady gain in weight, while on the 2-7-3 modification there was very marked and rapid gain in weight. The Finkelstein food was undoubtedly of marked value in both these cases. After its administration the gas bacillus disappeared in each case. Again the low sugar content of the food undoubtedly rested the gastrointestinal tract, so that after four weeks of its use an increase of sugar ad maximum (7 per cent. lactose) was not only tolerated, but utilized with great benefit to the child. Finkelstein's food is undoubtedly of great value for short periods in suitable cases, for its effect upon the intestinal flora (substitution of acidophilic for putrefactive organisms) and also because of its power to rest the gastrointestinal tract by its low sugar content, especially for cases previously overloaded with sugars.

**Anemia in Children.**—H. T. Ashby (*Med. Chron.*, Sept., 1912, 312) says that in any child, who has marked anemia without a demonstrable cause, it is well to bear in mind, that there may be a tuberculous infection of the mediastinal glands. This enlargement of the mediastinal glands is often only to be detected by an x-ray examination of the chest. Blood destruction seems to be greater in these cases than in tuberculosis of the lungs. Any sudden anemia of chlorotic type in a child above the age of about five

years is suggestive of an attack of acute rheumatism in the absence of diphtheria, a disease which, like chorea, also produces severe anemia very quickly. The anemia of rheumatism differs from most other anemias in not responding to the iron treatment. As soon as the rheumatic poison is counteracted by the sodium salicylate the body seems to get enough iron, etc., from the food. The anemia that occurs as a sequel of a series of attacks of rheumatism is very often chronic and difficult to deal with efficiently because it is complicated with heart disease. It is generally found in rather older children than the acute cases. The children appear well in other ways. Chronic heart disease in children is, in the great majority of cases, one of the results of rheumatism, and so also is the anemia one of the after-effects of the rheumatic toxin, which is prevented from recovery by the heart disease, whether it be endocarditis or myocarditis. This anemia is very persistent and difficult to cure. If compensation is sufficient then there is practically no anemia, but, on the other hand, if the lesion is not compensated, there may be extreme anemia together with cyanosis. The writer describes also a type of anemia, apparently identical with chlorosis, occurring in children from the age of ten years upward, and most commonly in girls.

**Massage in Wasting Diseases of Children.**—J. M. MacPhail (*Brit. Jour. Child. Dis.*, 1912, ix, 404) advocates the use of general massage in wasting diseases of children. He cites two cases which showed constant gain of weight when this was employed though no change was made in the diet.

**Idiocy and Congenital Syphilis.**—H. R. Dean (*Brit. Jour. Child. Dis.*, 1912, ix, 385) states that only a small proportion of idiots show the classical signs and symptoms of congenital syphilis, and if we are restricted to the usual methods of examination we must come to the conclusion that congenital syphilis has little connection with idiocy. However, in examining 330 of the inmates of the Wilhelmstift, an asylum for idiots at Potsdam, a positive Wassermann reaction was obtained by the writer in fifty-one cases (15.4 per cent.). Among thirteen parents of children giving a positive reaction, nine were found to give a positive reaction. A grouping of the 330 cases according to age appears to show that the percentage of positive results diminishes rapidly after the sixteenth year, and that a larger percentage of positive results might be expected from the examination of a series of very young cases. It seems possible that the very contradictory results already published may be reconciled by taking the age-factor into consideration. Of the fifty-one cases in which a positive serum reaction was obtained only seven showed conclusive evidence of congenital syphilis from a clinical standpoint. They are, in fact, cases of latent syphilis, and during the latent stages of the acquired disease only some 40 to 50 per cent. of the patients give a positive reaction. The writer thinks that the actual percentage of positive results obtained by examining a series of idiots by the serum test comes very far short of the number which are

actually infected. If this assumption is correct, we shall have to recognize syphilis as the causative factor in a very considerable percentage of cases of idiocy. If this can be established it is reasonable to hope that very great success will follow the application of therapeutic and prophylactic measures.

**Bismuth Poisoning.**—The popularity of Beck's bismuth paste for treatment of tuberculous abscess makes recognition of the danger of toxic results important. Leo Mayer and George Baehr (*Surg., Gyn. and Obst.*, 1912, xv, 309) present a review of the literature, showing that there are three distinct types of intoxication due to the use of bismuth: first, an acute experimental metallic poisoning, of which no clinical cases have been reported; second, a chronic metallic poisoning produced by either the external application or the subcutaneous injection of almost any bismuth salt; third, an acute intoxication resembling nitrite poisoning following the internal administration of bismuth subnitrate. The intoxications following the use of Beck's bismuth paste belong almost entirely to the second class, chronic metallic poisoning. To this group belong three cases reported by the writers. Their conclusions from a study of these cases and the literature are that bismuth is readily absorbed from a granulating surface. When absorbed, it may have extremely toxic effects. It should, therefore, never be applied as a dusting powder (dermatol) or salve to extensive granulating areas. Beck's bismuth paste should be used only with the greatest caution. Although small quantities (5–10 grams) cannot be considered dangerous, the possible toxic effect should constantly be kept in mind even with these small quantities, and, at the slightest evidence of intoxication, the bismuth should be thoroughly evacuated. In Reich's fatal case, less than 25 grams of paste were injected. When larger quantities of paste are required, some less toxic drug, as magnetic iron oxide, should be used. Two new features are to be added to the clinical picture of bismuth poisoning: 1. Stippling of the red blood cells. 2. A morbilliform rash. The writer's pathological and clinical studies have shown that: 1. Bismuth is absorbed from granulating areas largely by the action of phagocytes. 2. A microchemical test is necessary for the identification of pigment granules in tissues containing bismuth by chemical examination. 3. Bismuth may be chemically present and even produce marked pathological changes—as in the kidney and colon—yet not be visible microscopically.

The literature of bismuth poisoning is also reviewed by L. M. Warfield (*Amer. Jour. Med. Sci.*, 1912, cxliv, 647) who records a case of poisoning in a girl of nine years after injection of 2 ounces of bismuth subnitrate paste into the sinus of an iliopsoas abscess. The sinus closed and none of the paste was extruded. Recovery was gradual. The writer emphasizes the importance of taking care that the paste injected into sinuses should be gradually extruded. Should it remain deep in the sinus it should be removed after a few days. In using it for x-ray work in the intes-



times it appears best to withhold it in inflammatory cases or where patients are much run down in health. Substitutes such as carbonate of bismuth and oxide of iron have been recommended and are now being extensively used. Peculiarly characteristic of bismuth stomatitis is the whitish diphtheritic membrane which caps the ulcers. The visceral lesions caused by bismuth also show that it is one of the metallic poisons and therefore should be used with caution.

**Appendicitis in Children.**—Among sixty cases of appendicitis of all ages, thirty-one women and twenty-nine children, under the care of S. F. St. Dd.'s Green (*Practitioner*, 1912, lxxxix, 508) during the last four years, threadworms were found in the appendix in thirteen cases, of whom nine were children, that is to say, in about 31 per cent. of the children suffering from appendicitis. In some cases in which threadworms were found there was distinct ulceration of the mucous membrane at the site occupied by the threadworms; and the writer does not doubt that, in these cases, they are the direct cause of the ulceration, as they damage the mucous membrane sufficiently to reduce the power of resistance to the action of the bacteria present in the appendix. Probably in a certain number of cases of perforation with abscess, in which no concretions have been found, threadworms may have been the original cause. The threadworms are often found at the extreme end of the appendix and deeply buried in the folds of the mucous membrane. As regards the indications for treatment of appendicitis in children, the author advises immediate operation in acute cases first seen within the first forty-eight hours. In acute cases first seen after the first forty-eight hours, (a) if the case is getting progressively worse, the pulse rate rising, the area of pain and tenderness increasing, and the tongue becoming dry, foul, and furred, an operation must be performed at once. (b) If perforation takes place and signs of general peritonitis develop, such as sudden and violent abdominal pain; small and frequent pulse, persistent vomiting, and general tenderness and rigidity of the abdomen, immediate operation is indicated. (c) If the symptoms and signs show that the disease is abating, the pulse rate falling as well as the temperature, the case should be carefully watched, and any surgical treatment may be delayed until all signs of active inflammation have disappeared, that is to say, until about two or three weeks after subsidence of the pulse and temperature. The symptoms may at any time again become acute and require operative treatment at once. Cases in which an abscess has formed should be operated upon as soon as this is discovered.

**Infantile Eczema and Indigestion.**—H. P. Towle and F. B. Talbot (*Amer. Jour. Dis. Child.*, 1912, iv, 219) present a preliminary study of the relationship of indigestion and infantile eczema. They find that the acutely inflammatory form of eruption in infantile eczema presents so many features which are constant in occurrence and in form that its claim for consideration

as a definite, fixed type of disease deserves further attention. For directly opposite reasons, the less intense inflammatory form or eruption cannot lay claim to such consideration. The stool findings show that the indigestion of fats and of carbohydrates are the only types which can be demonstrated to occur with any regularity and definiteness in association with infantile eczema. The occurrence of the acute exudative type of eczematous inflammation of the skin in such frequent association with an indigestion of fats and sugar indicates that the process in the skin and the process in the digestive tract probably have some etiologic relationship. Contrariwise, the fact that the majority of infants presenting the same symptoms of indigestion do not likewise present a cutaneous reaction points to the inevitable conclusion that some underlying condition, probably systemic, which the eczematous infants possess, is lacking in the non-eczematous individuals. Therefore, indigestion must occupy an intermediate position, if any, in the mechanism of the production of eczema.

**Pancreatic Ferments in Infants.**—In the investigations of A. F. Hess (*Amer. Jour. Dis. Child.*, 1912, iv, 205) fluid was aspirated with a duodenal catheter from infants varying in age from a few hours to a year, some normal, some ailing, and was examined for amylase, lipase and for trypsin. A considerable number of new-born infants were tested before they had been put to the breast. Without the stimulus of food to incite secretion, the three pancreatic ferments were found in the intestine. During the first week of life the amount of the pancreatic secretion is still very scanty, but it contains the starch-splitting enzyme with increased regularity. In older infants, a month or more of age, there is both an increase in the quantity of pancreatic juice, and a decided augmentation of its amylolytic power. It would seem as if the infant was furnished with enzymes competent to digest not only its natural food, mother's milk, but also artificial food. This amylase has the power of digesting a 1 per cent. starch solution, or, for example, barley water. It seems unwise at present to draw conclusions of an absolute quantitative nature from the tests of ferments; however, the writer was unable to demonstrate a selective activity of the pancreatic juice—such as an increased strength of amylase when barley water was mixed with the milk, or of lipase when the percentage of fat was increased. The secretion of a large amount of amylase by the nursing baby would also argue against absolute specificity in this regard. Some sick infants were tested. It was soon evident, in a study of marasmus, that the hypothesis is untenable, which suggests that this disease is associated with or is caused by a deficiency of these ferments. Even in advanced cases they were not lacking. It would seem probable, therefore, that absorption is not essentially defective, for the pancreatic enzymes are concerned mainly with the preparation of food for absorption, but that the essence of this disturbance is one of retention and

assimilation. Some of these atrophic infants, although secreting little gastric juice to act as a stimulus, secreted a very large amount of thin, watery juice, containing all the pancreatic ferments, although weak in lipase. This pathologic condition the author terms "paralytic hypersecretion or succorrea," as it suggests the hypersecretion following the severing of the chorda tympani nerve. The loss of alkali due to the outpouring of this secretion, which serves no end, as it does not neutralize acid, may constitute an important loss to the body, and seems worthy of further study. This is all the more probable when we consider that dogs with pancreatic fistulæ cannot be kept alive for long periods unless they are given alkali. Cases of pylorospasm associated with gastric hypersecretion furnished numerous examples of pancreatic overactivity of a quite different nature. In these instances the gland probably was overstimulated by the normal agent, the gastric juice. Such cases may be termed "functional pancreatic hypersecretion," and later may develop into the paralytic type.

**Blood-cultures during Life in Infants and Young Children.**—M. Wollstein and E. Morgan (*Amer. Jour. Dis. Child.*, 1912, iv, 197) readily obtained blood for bacteriologic examination from the external jugular vein in infants as young as ten days of age. The technic of the authors was as follows: The patient having been tightly wrapped in a sheet to secure the arms at the sides and prevent struggling, was placed on a table. The head was turned to one side, hyperextended over the end of the table and supported in that position by an assistant. The operator's hands were sterilized in the usual manner. The site of aspiration was washed with alcohol and dried, after which tincture of iodine was applied and allowed to remain for three minutes. In few cases was the vein so obscured as to necessitate the removal of the iodine before puncture. The entrance into the vein was most readily effected during a paroxysm of crying when the vessel was distended. Digital pressure above the clavicle was found to be practically valueless in increasing the prominence of the vein. A 2-c.c. Luer syringe was used with a 22-gauge needle 1.5 cm. in length. The needle was inserted into the vein in the direction of the blood current and 1 c.c. of blood was drawn off and transferred directly to 30 c.c. of bouillon. It is important that the concentration should not be greater than one in twenty or thirty in order to avoid bactericidal action of the blood. Broth of a reaction of +0.5 per cent. of phenolphthalein was used in making these cultures. Fluid media give better results than do solid ones. Three points in the technic are worth emphasizing: the iodine should remain on for at least three minutes before puncture; the puncture should be performed through the iodine whenever possible; it is essential that the vessel be entered with the least possible manipulation in order to avoid contamination from the deeper layers of the skin. In a few cases, usually well-nourished babies, the jugular vein is completely obscured by the subcutane-



ous fat. The pneumococcus was found before the crisis in the blood in four out of thirteen cases of lobar pneumonia (30.8 per cent.), all of which patients recovered. A bacteriemia was demonstrated in six out of twenty-six cases of bronchopneumonia (23 per cent.), the pneumococcus being recovered in four and the streptococcus in two. Both streptococcus patients died and one pneumococcus case also proved fatal. In eight bronchopneumonia cases without bacteriemia the patients also died. The highest percentage of positive blood cultures was found in cases of empyema: nine of fourteen, or 64.3 per cent. But even in empyema bacteriemia does not necessarily mean a fatal prognosis, as in 33.3 per cent. of the positive cases the children recovered.

**Acute Appendicitis in Children.**—Analyzing a series of 208 cases of appendicitis in children up to seven years of age included in the records of the London Hospital for the last ten years, H. E. S. Stiven (*Practitioner*, 1912, lxxxix, 527) finds a mortality of 41.8 per cent.; perforation or gangrene in 31.2 per cent.; general peritonitis in 25.9 per cent.; spreading peritonitis in 11.1 per cent.; localized abscess in 40.4 per cent.; and inflammation limited to the appendix in 14.4 per cent. Of the total number of cases of appendicitis, 4239, admitted during this same period, 506 died: a percentage mortality of 11.9. Thus we see that the percentage mortality for children is 41.8, and for other cases eight years and upward 10.3 per cent. It is possible that this higher mortality in children may be connected with the relative shortness of the omentum. Owing to their greater liability to a generalization of the infection, early operation is more imperative in children. It will be seen from the figures, given above, that the odds are three to two on this generalization of the infection arising; whereas, if they are operated on within twenty-four hours, the mortality, for this series at least, is nothing. A prolonged operation and undue exposure cause relatively greater risks. In the after-treatment, certain special arrangements will make all the difference between success and failure. The Fowler position is even more valuable in children than in adults. Children do not retain salines given continuously by rectum well, but will usually retain 8 to 10 ounces given slowly every two to four hours. Children cannot bear starvation. Raisin tea, a decoction of crushed raisins, may be given with advantage; a feed of this, alternated with albumin water, will provide them with proteid and a carbohydrate (dextrose), which is absorbed directly unchanged. The bowels should be opened as soon as possible. If a normal motion is not passed within twenty-four hours after the operation, a glycerin enema should be given, and syrup of senna used as the routine aperient.

**Amputation in Infantile Paralysis.**—The usual tendency of modern surgery is toward conservatism. E. M. Cornen and C. E. Bashall (*Lancet*, Sept. 23, 1912), however, record a series of eight cases of amputation through the thigh or leg for the

treatment of neglected infantile paralysis. All improved greatly in general condition, and, fitted with an artificial leg, the oldest has become self-supporting and others will do so. These cases are reported as showing that it is easy for conservative treatment to be carried too far, easily, perhaps, among the well-to-do, and very easily among the poor.

**Treatment of Nocturnal Enuresis.**—After briefly reviewing the many methods of treatment advised; Mello-Leitaõ (*Brit. Jour. Child. Dis.*, 1912, ix, 454) reports five cases cured by Cathelin's method of epidural injections of artificial serum. This method, the writer states, acts by suggestion. In two other cases these injections failed, and in one of them lumbar punctures were also unsuccessful while the other recovered under renal opotherapy. Fresh sheep kidneys, 10 grams daily, were given for over eight months though enuresis ceased on the thirty-eighth day.

**Blood-pressure in Scarlet Fever.**—J. D. Rolleston's (*Brit. Jour. Child. Dis.*, 1912, ix, 444) remarks are based upon observations made on 122 cases of scarlet fever with C. J. Martin's modification of Riva-Rocci's sphygmomanometer and are confined to systolic pressure. In this series the blood pressure was found to be subnormal in 25 per cent., the extent and duration of the depression being as a rule in direct relation to the severity of the initial attack. In the great majority the highest readings were found in the first week; there was also a predominance of the lowest readings in the same week, but in a large minority the lowest readings were found in the second week. The normal tension was usually reestablished by the fourth week. In the majority of cases the blood pressure was lower in convalescence than in the acute stage. In 48.4 per cent. of the convalescent cases the readings in the recumbent and erect positions were the same, or the recumbent was higher than the vertical record until convalescence was firmly established (hypotension of effort). With the exception of nephritis, complications had little, if any, effect upon the blood pressure. In only a minority of the nephritis cases—twelve out of thirty-three—was the blood pressure above normal, and the hypertension was never extreme nor of long duration. Sphygmomanometry in scarlet fever, as in most of the other acute diseases, is of little practical importance in the acute stage, but in convalescence may give some indication of the severity of the renal lesion which may be of value in subsequent treatment of the patient. Pronounced arterial hypotension, especially if accompanied by other signs of acute suprarenal insufficiency, should be treated by adrenalin or suprarenal extract.

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